THE ADVERSE HEALTH EFFECTS ASSOCIATED WITH AFLATOXIN HAZARDS

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AFLATOXIN HEALTH EFFECTS

Adverse health effects associated with aflatoxin hazards

Aflatoxin is a fungal toxin of various poisonous carcinogens and mutagens that is produced by certain moulds. The main fungi that produce aflatoxin is Aspergillus flavus and Aspergillus parasiticus. The fungi grow in soil, decaying vegetation and various staple foodstuffs. Aflatoxin is produced by fungal action during the production, harvest, storage or processing of feed that contaminates maize and other agricultural crops. In developing nations, many people are exposed to aflatoxin through food grown at home. They can appear as a result of inadequate harvesting and storage thechniques in warm and humid conditions. When such foods are contaminated, aflatoxins enter the general food supply and can be found in human foods as well as feedstock.

There are several types of aflatoxins are produced naturally. Aflatoxin B1 is the most common in food and among the most potent genotoxic and carcinogenic aflatoxins. The major aflatoxins are B1, B2, G1, and G2, which can poison the body through respiratory, mucous or cutaneous routes, resulting in overactivation of the inflammatory response (Romani, 2004). Food safety is among the many problems facing the current world today. Taking Kenya as an example in the year 2004, there was an unprecedented epidemic outbreak of human aflatoxin poisoning that was recorded in the country. There was said to be at least 500 acute human illnesses and 200 deaths that were reported due to aflatoxins. Aflatoxin toxicity may result in nausea, vomiting, abdominal pain, convulsions, and other signs of acute liver injury. Long term exposure can be associated with several adverse health effects such as liver damage, immunosuppression, growth impairment, acute toxicity, reproductive disorders, and carcinogenic effects. These effects will be discussed below.

- Growth impairment: Children are particularly linked to stunted growth due to aflatoxin exposure. In developing countries, where there is a significant intake of aflatoxin contaminated foods poses as a threat to children. It has detrimental effects on their physical growth, including stunting, wasting, and low weight. It also true that exposure can hinder their learning development and in some cases can also lead to cases of death in some of this children.
- 2. Immunosuppression: Aflatoxin can also weaken the immune system especially for those having HIV/AIDS and undergoing chemotherapy. This makes them more susceptible to infections and diseases. Also immunosuppression due to B1 aflatoxin has been been demonstareted in various livestock species.
- **3. Carcinogenic effects:** Chronic exposure to aflatoxins may result in liver cirrhosis and increased risk of liver cancer, particularly hepatocellular carcinoma. The clinical

manifestations due to aflatoxins include vomiting, abdominal pain, and necrosis of the liver. Aflatoxin especially the aflatoxin B1 is particularly known for binding with DNA that leads to mutations causing tumors.

- **4.** Acute toxicity: This describes the adverse effect of a substance in this case aflatoxin that result either from a single exposure or multiple exposures in a short amount of time. It is also characterized by symptoms such as vomiting, abdominal pain, convulsions, and coma. In severe cases there is an increasing lead to mortality rate. In simple terms death.
- 5. Reproduction disorders: Exposure to aflatoxin may affect the reproductive health in both men and women. In men the target organs in the male reproductive toxicity are the testicles and various aspects of spermatogenesis. It has also been associated with reduced sperm motility, concentration, and overall quality in the male reproductive system. In the females, it can contribute to menstrual disorders and fertility issues.
- 6. Liver damage: Primarily, aflatoxins are metabolized in the liver and converted into extremely toxic forms to engender hepatoxicity. This means that a prolonged exposure to this toxic substances can lead to liver damage and in some cases can lead to liver cancer.

METHOD

This research has been acquired through various published literature sources online.

RESULTS

The adverse health effects associated with aflatoxin hazard shows that this affects mostly developing countries who are not well equipped with knowledge on the different techniques on proper harvesting, storage, and processing of foods. As much as this affects us humans, the effects are also seen in animals. It has also been seen that aflatoxin infection has various symtoms such as vomiting and abdominal pains. The adverse effects have been discussed above. To mitigate the adverse effects associated with aflatoxin hazards, various measures can be adapted. This includes; proper agricultural practices, appropriate storage and processing techniques, and regularly testing for the contamination of aflatoxins in foodstuffs.

REFERENCES

1.

- 2.
- 3. Fratamico PM, Bhunia AK, Smith JL (2008). Foodborne Pathogens: Microbiology and Molecular Biology. Norofolk, UK: Horizon Scientific Press. <u>ISBN 978-1-898486-52-7</u>.
- A. A Iqbal SZ, et al. (2014). "Natural incidence of aflatoxins, ochratoxin A and zearalenone in chicken meat and eggs". Food Control. 43: 98–103. <u>doi:10.1016/j.foodcont.2014.02.046</u>.
- A Khlangwiset P, Shephard GS, Wu F (October 2011). "Aflatoxins and growth impairment: a review". Critical Reviews in Toxicology. 41 (9): 740– 55. <u>doi:10.3109/10408444.2011.575766</u>. <u>PMID 21711088</u>. <u>S2CID 19262759</u>.
- 6. ^ Jump up to:^{a b} Abbas HK (2005). Aflatoxin and Food Safety. CRC Press. ISBN 978-0-8247-2303-3.
- Smith LE, Prendergast AJ, Turner PC, Mbuya MN, Mutasa K, Kembo G, Stoltzfus RJ (December 2015). <u>"The Potential Role of Mycotoxins as a Contributor to Stunting in the SHINE Trial"</u>. Clinical Infectious Diseases. 61 Suppl 7 (Suppl 7): S733– 7. doi:10.1093/cid/civ849. PMC 4657594. PMID 26602301.
- Voth-Gaeddert LE, Stoker M, Torres O, Oerther DB (April 2018). "Association of aflatoxin exposure and height-for-age among young children in Guatemala". International Journal of Environmental Health Research. 28 (3): 280– 292. doi:10.1080/09603123.2018.1468424. PMID 29706087. S2CID 23510545.
- 9. <u>^</u> Turner PC, Collinson AC