

Application of Modern Agricultural Practices to Reduce Aflatoxins Exposure in Developing Countries

Zahra Pilevar and Hedayat Hosseini*

Food Sciences & Technology Department, National Nutrition & Food Technology Research Institute, Faculty of Nutrition Sciences and Food Technology, Shahid Beheshti University of Medical Sciences, Tehran 1981619573, Iran

***Corresponding Author:** Hedayat Hosseini, Food Sciences & Technology Department, National Nutrition & Food Technology Research Institute, Faculty of Nutrition Sciences and Food Technology, Shahid Beheshti University of Medical Sciences, Tehran 1981619573, Iran.

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In developing countries with poor infrastructure, harvesting and storage/stock methods for foods, mycotoxins of greatest importance as aflatoxins are naturally occurring in agricultural products. These carcinogenic, mutagenic and teratogenic secondary metabolites are produced by several species of filamentous fungi *Aspergillus* sect. *Flavi* mainly *A. flavus*. Aflatoxins contaminate various agricultural commodities such as maize and peanuts at different stages of food chain either pre- or post-harvest or might be excreted in hydroxylated form in milk and milk products. Therefore, human exposure to aflatoxins both in unconjugated/conjugated forms is mainly through consumption of contaminated plant-derived and milk products as these compounds are resistance to heat within the range of conventional treatment temperatures. AFB1 as the most toxic and common aflatoxin induces primary liver cancer that exhibits synergistic activity with hepatitis B virus infection, where in Asian developing countries hepatitis B is prevalent [1].

Given that incidence of aflatoxins-producing fungi in crops is not exactly associated with increased contamination due to differences in virulence to host plants, competitive ability and other factors, the higher frequencies of aflatoxins-producing fungi leads to severity of contamination and finally the product losses [2]. Production of aflatoxins is influenced by many abiotic and biotic factors; however, it is mainly reported to occur by high relative humidity and temperatures of unseasonal rains due to climate changes at the time of harvest [3]. Occurrence and extent of aflatoxins contamination might also be associated with unsuitable cultivation, storage and transport conditions.

International Agency for Research on Cancer (IARC) has classified AFB1 and AFM1 as group 1 carcinogens [4, 5], which confirms the continuous need to protect humans and also domestic animals by limiting their exposure to these carcinogenic compounds. The health-related impacts of aflatoxins is associated with concentration, frequency and duration of exposure, thereby, actions and regulations in terms of limits can be undertaken to lower the risks of aflatoxicosis. On the other hand, providing efficient data on toxicological characterization, distribution and exposure of these mycotoxins can help to reduce the incidence of aflatoxins according to analytical studies and risk assessment [6]. Some suggested methods for reduction of aflatoxins and their toxicity are exclusion of aflatoxin producing fungi by toxigenic strains either simultaneously or with an interval time difference, using aflatoxin's binders and additives in animal feed, ozone fumigation and treatment with ammonia, use of probiotic bacteria to reduce aflatoxin uptake, control grain damages, insects attack and immediate drying of product after harvest, vaccination against hepatitis B, application of superabsorbent polymers, essential oils and etc.

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In conclusion, as a result of toxicological manifestations and economic losses including lost export opportunities, management of aflatoxins contamination using hazard analysis critical control point systems (HACCP) as a systematic preventive approach on scientific basis should be considered for agricultural commodities. However, increased attention has focused on strategies directed at decreasing exposure to aflatoxins rather than elimination of these toxins. Therefore, legislative work in this subject for regulated food processing and marketing systems according to food safety policies and standards are necessary to be carried out particularly in Asian developing countries with higher incidence of aflatoxins in foods.

References

1. Probst C., *et al.* "Diversity of aflatoxin-producing fungi and their impact on food safety in sub-Saharan Africa". *International journal of food microbiology* 174 (2014): 113-22.
2. Gibb H., *et al.* "Asian Implications of Aflatoxin and Dioxin Foodborne Chemical Exposures Based on World Health Organization Estimates". *Asia Pacific Journal of Medical Toxicology* 4.4 (2015): 131-133.
3. Bhat RV and Vasanthi S. Food safety in food security and food trade. Mycotoxin Food Safety Risk in Developing Countries IFPRI Brief. (2003).
4. M. Kujawa. "Some naturally occurring substances: food items and constituents, heterocyclic aromatic amines and mycotoxins. IARC Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Humans". *Molecular Nutrition & Food Research* 38.3 (1994): 351.
5. Fumonisin B. "Some traditional herbal medicines, some mycotoxins, naphthalene and styrene". *IARC monographs on the evaluation of carcinogenic risks to humans* (2002).
6. Milićević DR., *et al.* "Real and perceived risks for mycotoxin contamination in foods and feeds: challenges for food safety control". *Toxins* 2.4 (2010): 572-592.

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