

Advances in Health Risk Assessment of Mycotoxins in Africa

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Abstract : Mycotoxins are a wide range of toxic secondary metabolites of fungi that contaminate various food commodities worldwide especially in sub-Saharan Africa (SSA). Such contamination seriously compromises food safety and quality posing a serious problem for human health as well as to trade and the economy. Their concentrations depend on various factors, such as the commodity itself, climatic conditions, storage conditions, seasonal variances, and processing methods. When humans consume foods contaminated by mycotoxins, they exert toxic effects to their health through various modes of actions. Rural populations in sub-Saharan Africa, are exposed to dietary mycotoxins, but it is supposed that exposure levels and health risks associated with mycotoxins between SSA countries may vary. Dietary exposures and health risk assessment studies have been limited by lack of equipment for the proper assessment of the associated health implications on consumer populations when they eat contaminated agricultural products. As such, mycotoxin research is premature in several SSA nations with product evaluation for mycotoxin loads below/above legislative limits being inadequate. Few nations have health risk assessment reports mainly based on direct quantification of the toxins in foods ('external exposure') and linking food levels with data from food frequency questionnaires. Nonetheless, the assessment of the exposure and health risk to mycotoxins requires more than the traditional approaches. Only a fraction of the mycotoxins in contaminated foods reaches the blood stream and exert toxicity ('internal exposure'). Also, internal exposure is usually smaller than external exposure thus dependence on external exposure alone may induce confounders in risk assessment. Some studies from SSA earlier focused on biomarker analysis mainly on aflatoxins while a few recent studies have concentrated on the multi-biomarker analysis of exposures in urine providing probable associations between observed disease occurrences and dietary mycotoxins levels. As a result, new techniques that could assess the levels of exposures directly in body tissue or fluid, and possibly link them to the disease state of individuals became urgent.

Keywords : mycotoxins, biomarkers, exposure assessment, health risk assessment, sub-Saharan Africa

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