

Editorial

Mycotoxins: Deadly menace in food and feed

Fungi produce a large number of toxins but not all of them are mycotoxins. Mycotoxins are low molecular weight natural products produced as secondary metabolites by some filamentous fungi. These metabolites constitute a toxic and heterogeneous chemical assemblage that are grouped together only because the members can cause disease and death in human being and other vertebrates.

All types of economic seeds and grains, after proper drying, kept under different storage conditions. Two types of fungi 'Storage fungi' (post harvest) invade seeds and grains in storage or transit with dried seeds having low or very low moisture, e.g. *Aspergillus restrictus*, *A. halophilicus*, *A. flavus* etc. The other group 'Field fungi' (pre- harvest) invade seeds and grains to standing crop in field when they have fair amount of moisture e.g. *Fusarium moniliforme*, *F. graminearum*, *F. culmorum* etc. Mycotoxins occur in most agricultural commodities under natural conditions in food and feed anywhere in the world and pose a threat to human and domestic animal health. They are often invisible, tasteless, chemically stable and resistant to temperature and storage. They remain unaffected during normal feed manufacturing processes or at the time cooking of food.

Currently more than 300 mycotoxins are known of which scientific attention is focussed mainly on those that have proven carcinogenic and/or toxic. Human exposure results from consumption of plant derived foods that are contaminated with mycotoxins and the carry over of mycotoxins and their metabolites in animal products such as meat, egg, milk etc. Mycotoxins like Aflatoxins, Ochratoxins, AcT1, Patulin, Citrinin, Trichothecenes etc. are of greatest public health concern and agro economic significance.

Many developing countries have realized that reducing mycotoxin levels in food or feed will not only reduce financial burden of the Governments on health care of the population but also increase international trade for the country like export. It has been suggested that good agricultural practices through improved agronomic policies will have profound effect on lowering mycotoxin contamination of crops in the field. For example, early harvesting of crop will reduce fungal infection of crop in the field before harvest and consequent contamination of harvested crop. Besides, proper drying immediately after harvest of agriculture crop to low level of moisture is critical as it creates less favourable condition for fungal growth and consequently mycotoxin formation.

In food and feed industries, it was often a common practice to add mycotoxin-binding agents such as bentonite or montmorillonite clay in order to absorb the mycotoxins. Efficiency of these agents depend on the following important criteria to reverse the adverse effects of mycotoxins, such as, stability over a wide pH range, high capacity to absorb high concentration of mycotoxins, high affinity to absorb even low concentration of mycotoxins and proven report with most mycotoxins. Besides, they should be non-toxic and environment friendly components

Since not all mycotoxins can be bound to such agents, the latest approach is detoxification using enzymes(esterase, depoxidase), or by application of some yeast (*Trichosporon*) or some bacterial strain(*Eubacterium*) during preharvesting contamination when mycotoxins can be reduced to a certain extent. Other methods like physical separation, washing, heat treatment, radiation, extraction with solvents and use of chemical or biological agents etc. have been reported to be of different efficacy. Irradiation methods have been reported to be effective inhibiting mould growth and toxin production.

Prof. B. Nandi

(balen.nandi@yahoo.com)