Mycotoxins and their effect on health

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Mycotoxins are toxins produced by some fungi when they grow on food; Most fungi produced mycotoxins are harmless, and even helpful. For example, the antibiotic penicillin came from a fungus, and it is a mycotoxin.

Common mycotoxins that are harmful to humans are

Aflatoxin:

- Aflatoxins are naturally occurring mycotoxins that are produced by many species of Aspergillus, a fungus, most notably Aspergillus flavus and Aspergillus parasiticus.
- Aflatoxins are toxic and among the most carcinogenic substances known.
- Aflatoxins are remarkably potent, often causing disease even when ingested in minute amounts.
- Aflatoxins can cause disease throughout the body, but are most commonly known for causing acute or chronic liver disease and liver cancer.
- Common foods that are affected with A. Flavus fungi are cereals, grains like maize, rice,wheat and sorghum, oil seeds like groundnut, cotton seed, coconut, soybean and sunflower, tree nuts like pistachio, almonds, walnuts, vegetable products like cocoa and spices like chillies and black pepper.
- Aflatoxins can be seen in milk and milk products if the milch animal is fed on feeds prepared from oil seed cake of infested ground nut, cotton seed and coconut.
- Aflatoxin can be seen in the oil extracted from infected oil seeds.
- High risk commodities for Aflatoxin are maize, ground nut, par boiled rice, cotton seed,copra and pistachio nuts.
- Aflatoxins are completely heat stable, so neither cooking nor freezing destroys the toxin.
- Aflatoxins grow on grains and legumes mostly during storage, so the grains and legumes must be stored correctly to limit this problem.

Ergot alkaloids

There are toxins released by the fungus belonging to the group Claviceps.

- These contaminate the cereals like wheat, rye and bajra during the pre harvest stages in the field.
- Consuming ergot alkaloids leads to diseases characterized by nausea, vomiting, giddiness and somnolence.
- In extreme cases it may lead to a gangrene of extremities.

Fumonisin mycotoxicosis

It is caused by toxin of fungi of Fusarium group.

- Commonly maize and sorghum are involved.
- May lead to abdominal pain and diarrhoea.
- Chronic exposure is shown to be carcinogenic.

Trichothecene and deoxynivalenol mycotoxicosis

It was once reported from Kashmir valley

- These toxins were separated from wheat contaminated with Fusarium group of fungus which grew on the standing crops of wheat during harvest season due to unseasonal rains.
- Toxic disease is characterized by abdominal pain, nausea and vomiting.

Prevention of mycotoxicosis

Mycotoxin contamination within agricultural commodities can be minimised by following plant breeding, good agricultural practices during pre and post harvest period and detoxification.

Plant breeding : Problem of ergot contamination of cereals and millets has been successfully minimized in the past by cultivation varieties of rye, wheat and pearl millet that were resistant to the disease.

Good agricultural practices:like avoiding water stress, minimizing insect infestation and reducing inoculum potential are effective in minimizing aflatoxin contamination in groundnut and maize.

Good post harvest practices like appropriate drying, storage, transport and marketing can help in reducing the fungal infection. If contamination does occur weeding out of mouldy or insect infested seeds from sound kernels of groundnuts, by handpicking or electronic sieving can help prevent further contamination.

Detoxification : It is the process of removing the mycotoxins. Attempts have been made to detoxify the aflatoxin from foods. The detoxified product is suitable only for

animal feeds and not for human consumption.

Source: Portal Content Development Team
