

## Aflatoxin

Secondary fungal metabolites capable of causing pathological changes or physiological abnormality in man and warm blooded animal are called, mycotoxin. These represent a wide variety of chemical compounds of secondary metabolism by some toxigenic moulds during the development food and feed materials. The toxic symptoms induced by the (ingestion) intake of mycotoxin contaminated food and feed are known as mycotoxicosis.

Aflatoxin is one type of mycotoxin which is produced as result of reaction between host and pathogenic fungi.

### Condition favouring aflatoxin production -

The aflatoxin was originally found to be produced by the fungus Aspergillus flavus. But it is now known to be produced by other species of Aspergillus like Aspergillus niger, A. nidulans, A. fumigatus etc. Aflatoxin is produced at high concentration in many infected plant parts like Peanut, cotton seed, ground nut, copra and also other seeds or nuts grown in warm and humid region. Aflatoxin production is controlled by the following factors. →

i) Relative humidity - It has been found that a relative humidity of 85% is favourable for aflatoxin production.

ii) Moisture content of plant part - In starchy cereal like maize Sorghum and wheat, the moisture content is 18.2%. While in fatty seeds like peanut the moisture content is 9-10% which favour aflatoxin production.

iii) Temperature - The minimum, optimum and maximum temperature for aflatoxin production are 12%, 27% and 42% respectively, maximum aflatoxin is produced under optimum temperature condition.

iv) Condition of seeds and grains - Seed and grains undergoing deterioration in nature also influence aflatoxin production. But it has not been thoroughly studied.

v) Substrate - A combination of a favourable substrate in a favourable environment is responsible for much higher aflatoxin risk material while soyabean has a low aflatoxin risk.

## Effects of aflatoxin on animal -

i) Aflatoxin produced by infected cereal grains and nuts degrade the carbohydrates, proteins and other cellular constituents.

ii) It has been proved that there is a definite correlation between aflatoxin consumption and hepatoma. It has also revealed that high incidents of human liver cancer and allied diseases occur in sudden regions of south-east Asia where people consume cereals, peanuts and other food stuff often infected with Aspergillus. In such cases aflatoxin acts as a mutagenic agent of hepatocellular chromosome.

iii) Aflatoxin may exist in a variety of derivatives with varying defects. When it is consumed by dairy cattle, it is excreted (8 to 20%) in the milk in toxic form. It has been reported that aflatoxin B-1 and its metabolised m-1 occur in mother breast milk.

iv) In small ~~doses~~ <sup>doses</sup> aflatoxin are tolerated by the human body and do not produce any apparent ill effect. But when aflatoxin is taken persistently in small doses ~~for~~ in results in paralysis.

## Preventing measure against bad results of aflatoxin -

To check the toxic effect of aflatoxin improved method of harvesting, drying and storage condition for preventing fungal growth on commodities have been recommended. As the aflatoxin is a metabolic product of living organism (fungus) and it exist in the natural ecosystem so it is impossible to eradicate aflatoxin producing fungi from the ecosystem.

## Some micotoxin producing fungi

<u>Name of the toxin</u>	<u>Producing organism</u>	<u>Bad effect</u>
1) Aflatoxin	<u>Aspergillus flavus</u> , <u>Aspergillus niger</u> , <u>Aspergillus nidulans</u>	hepatotoxic, carcinogenic and induces paralysis
2) Ochratoxin toxin	<u>Aspergillus ochraceus</u> <u>Penicillium viridicatum</u>	Nephrotoxin.