What is aflatoxin?
Many agricultural commodities are vulnerable to attack by a group of fungi that produce toxic metabolites called mycotoxins. Among these mycotoxins, aflatoxins have assumed significance due to their harmful effects on human beings, poultry and livestock. Two species of fungus *Aspergillus flavus* (predominant in Asia and Africa) and *Aspergillus parasiticus* (mostly found in the Americas) produce aflatoxins on various food products. One of the most dangerous aflatoxins finds its way into the milk systems of animals who have consumed contaminated feed (usually groundnut cake or haulms with small pods). This is called aflatoxin M₁.

The effects of aflatoxin contamination
- Aflatoxin is carcinogenic and can cause liver and other cancers in humans.
- It is synergistic with hepatitis viruses B and C.
- It lowers the body’s normal immune response to invasion by foreign substances.
- It impairs growth in children, notably in Africa, and causes childhood cirrhosis in India.
- In poultry and livestock, aflatoxin can cause feed refusal, loss of weight, reduced egg production and contamination of milk.

Managing aflatoxin in groundnut

Food products susceptible to aflatoxin contamination

- **Cereals:** maize, sorghum, pearl millet, rice, wheat
- **Oilseeds:** groundnut, soybean, sunflower, cotton
- **Spices:** chilli, black pepper, turmeric, coriander and ginger
- **Nuts:** almond, pistachio, walnut, coconut
- **Milk and milk products**

How aflatoxin affects groundnut

- Causes marked deterioration in kernel quality because of fungal growth. Contaminated kernels are then unfit for the markets or for consumption.
- Causes decay in both seeds and non-emerged seedlings and leads to aflaroot disease.
- Severely affects the export of groundnut and its products.

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Factors contributing to contamination in groundnut

**Preharvest**
- Presence of the *A. flavus* fungus in soil and air. This infection of groundnut, which occurs at every stage from preharvest to storage, causes aflatoxin production in the kernels.
- Use of susceptible cultivars.
- End-of-season moisture stress to the crop for more than 20 days.
- Mean soil temperatures of 28-31°C in the pod zone.
- Growth cracks and mechanical injury to the pod.
- Insect damage to pods by termites or pod borers.
- Death caused by diseases (stem, root and pod rots) at pod maturity stage.
- Nematode damage to the pod.

**Postharvest**
- Harvesting an overly mature crop.
- Mechanical damage to the pod at the time of harvest.
- Stacking the harvest when pod moisture is more than 10% or under high humidity conditions.
- Damage to the pod by insects during storage.
- Storing haulms with immature or small pods (they tend to contain more aflatoxins).
- Gleaning pods from the soil after harvest.
- Rewetting stored pods due to factors like ground-moisture or roof leakage.

How can aflatoxin be contained?

**Preharvest**
- Use aflatoxin-resistant groundnut varieties.
- Select sound seed and treat them with Diathane M45 (@ 3g/kg) before planting.
- Apply farm yard manure/compost @ 5-10 tons/ha.
- Apply Trichoderma @ 1kg/ha.
- Maintain optimal plant population in the field (33 m²).
- Apply gypsum (@ 400-500 kg/ha) at flowering.
- Avoid end-of-season drought with irrigation, if possible.
- Control foliar disease using Kavach with 1-2 sprays.
- Remove dead plants from the field before harvest.
- Harvest the crop at right maturity.

**Postharvest**
- At harvest, avoid mechanical damage to the pod by inserting the blade or plow below the pod zone.
- Dry the harvested produce for 3-5 days using the inverted windrow drying method.
- Dry the produce until the pod moisture is below 8%.
- Strip or thresh the pod immediately after drying. Avoid stacking.
- When using mechanical threshers, use appropriate sieves based on pod size so that immature pods are blown off.
- Remove mechanical- and insect-damaged pods.
- Separate the fully mature large pods (to be used for raw consumption) from the remaining produce (used for oil extraction).
- Do not mix the gleaned pod with the main produce.
- If necessary, dry the stripped/threshed pod once again to maintain seed moisture below 8%.
- Stack the pod-filled gunny bags on a wooden plank and store them in well aerated, waterproof storage.
- Prevent insect damage to the pods in storage.
- Remove all immature pods attached to the haulms.