

# Aflatoxin Control

## Revamping smallholder groundnut production



Top 20

Innovations that  
Benefit Smallholder  
Farmers

## What is aflatoxin?

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Aflatoxin is a poisonous chemical formed by common soil-borne moulds of the genus *Aspergillus*. The fungus (mould) is widespread in the tropics and found on many crops, including maize and groundnuts. It is often exacerbated during drought-affected production years or if high yields surpass local post-harvest infrastructure for drying and storage. *Aspergillus* can be fairly easily seen as a yellow or green mould, but that is not an adequate indicator of contamination by aflatoxin. The chemical cannot be eliminated through cooking or other simple processing and is toxic to humans and animals even at very low doses.



Source: [www.cgiar.org](http://www.cgiar.org)

## Why is aflatoxin important?

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**HEALTH:** Aflatoxin is highly carcinogenic and leads to liver cancer under chronic exposure. Consumption of highly contaminated crops has led to cases of acute aflatoxicosis and even death. Consumption of products contaminated with aflatoxin is strongly linked with immune suppression and childhood stunting, including reduced birth weight. Aflatoxin also negatively impacts the health of livestock and can even enter the human food system through animal based foods, such as milk and eggs.

**TRADE:** Aflatoxin is also a major limiting factor of trade. Regulatory bodies have established a limit on the amount of aflatoxin allowed in food and feeds. With the EU enforcing a very high standard of four parts per billion on imported groundnuts, virtually all significant trade with African groundnut producers has ceased. As nations across Africa begin to enact their own standards, regional trade will also be limited, which will negatively impact farmers' prices because of reduced demand.

**LIVELIHOODS:** The combination of health impacts and trade limitations due to aflatoxin contamination negatively impacts rural livelihoods in groundnut producing regions.

## How can aflatoxin be controlled in groundnuts?

The causes of aflatoxin contamination and solutions to control are linked throughout the entire value chain. A holistic approach is necessary to achieve adequate reductions in contamination, including correct market incentives that recognise the efforts of individual farmers.

### Production level control

All aspects of production that improve plant health will reduce the risk of aflatoxin contamination.



Illustration: Robert Hartwig

This is good news for the farmer, because following these good agricultural practices (GAPs) will also improve their yields.

Examples include:

- Use of improved cultivars which are resistant to diseases, drought-tolerant and early maturing.
- Use of good quality seed with a high germination rate that will produce a dense stand of groundnuts, thereby reducing weed potential.
- Rotating groundnuts with other crops, such as maize or sorghum, to break the disease cycles and improve soil fertility.
- Use of appropriate soil amendments, such as lime (calcium) or animal manure.
- Use of appropriate pesticides that control insect pests (particularly those that cause pod damage), and foliar fungicides that maintain plant vigour.
- Timely planting to avoid late season drought.

## Harvest/post-harvest level control

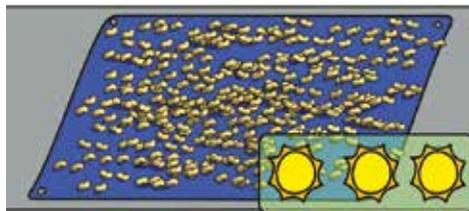
Even high quality groundnuts (peanuts) will often have some small level of field contamination. The following critical actions during harvest, drying and storage can prevent wider proliferation of the *Aspergillus* mould.

- Harvest in a timely manner that avoids over-maturation and pod rot in the field. If plants exhibit signs of drought stress near maturation, it may be better to harvest before contamination spreads.

Harvest on time



Dry thoroughly and off the ground



Sort and store in clean breathable sacks



- Avoid mechanical damage to pods and remove as many damaged pods as possible.
- Drying should be timely and thorough. Drying in the field is possible, but should be actively managed to promote drying below 10% moisture as soon as possible. Consider immediate threshing and drying if possible.
- Pods should be dried on tarpaulins rather than on the ground.
- Remove all damaged, immature or rotten pods BEFORE long-term storage. These are high-risk elements that can spread contamination in storage.

Store in dry, well-ventilated cool room



Illustrations: Robert Hartwig

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- Store groundnuts in clean, breathable sacks that allow for ongoing respiration.
  - Store groundnuts IN-SHELL as long as possible. Shelled groundnuts are much more likely to cross contaminate.
  - Avoid wetting the pods during shelling.
  - Long-term storage should be in dry, well ventilated, cool spaces with rodent and pest control.
  - Use of dried neem leaves can be considered for insect control for long-term storage.

## Case study: Meds & Food for Kids (MFK)

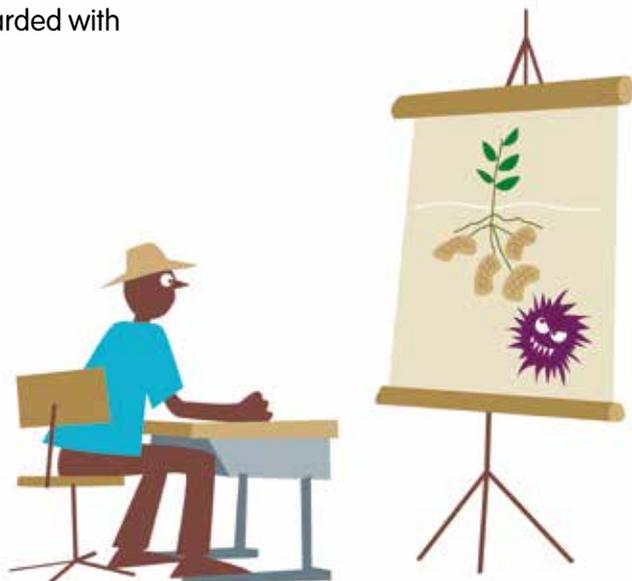
MFK is an approved supplier of groundnut-based 'ready-to-use' foods to the UN Children's Fund (UNICEF) Haiti. Since 2004, MFK has been using locally sourced groundnuts (>180,000 kgs) and has achieved EU standards using a model that supports smallholder farmers through training, collaborative research and price incentives. Beginning in 2012, a private supply chain company, Acceso Peanut Corp., has expanded the model to new regions and opened up new markets to farmers. During the initial 2 year pilot phase, Acceso procured >100 MT of low-aflatoxin groundnuts from >800 farmers. By providing GAP training and offering access to credit for quality seed and inputs, farmers have increased yields by 30% and farm income by 100%.

## Market and policy actions

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Application of GAPs require an institutional and policy environment and private sector engagement to incentivise farmers.

- Use of simple, lateral flow dipstick tests should be done prior to aggregation (before several farmers' groundnuts are mixed together).
- Traceability to the individual farmer should be maintained to reward the farmer for higher quality and to isolate high aflatoxin samples for diagnosis of cause.
- Farmers following recommended practices should be rewarded with higher prices.
- In areas of weak institutions, external standards should be applied until policymakers and enforcement can catch up.
- Awareness and education should encompass producers and consumers.
- Investments must be made for alternative uses of contaminated groundnuts to prevent their consolidated use in human or livestock feed. Options include: quality oil-exPELLing, livestock feed with binders, or energy production.



## Replicable market model

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### Extension training for good agriculture practices

Credit for services and inputs



### Extension training on proper post-harvest storage and handling

Access to storage depot

Breathable mesh bags

Tarps for drying crop



### Moisture and aflatoxin testing at point of purchase

Direct feedback to farmers about quality

Price incentive for adopting practices

Lot identification for traceability



### Aggregation and distribution to markets and buyers

## For more information:

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