

# Hazardous mold contaminates many food staples: What you should know about mycotoxins

March 28 2024, by Oluwadara Pelumi Omotayo

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Mycotoxins are substances produced by mold that poison food. They are [harmful](#) to humans and animals when consumed. According to the Food

and Agricultural Organization (FAO), about 25% of the world's agricultural harvests are [contaminated](#) by mycotoxins. Though reliable data is lacking, mycotoxin contamination is [widespread in Africa](#). It often takes the form of aflatoxin in cereal crops and has led to [health issues](#) such as chronic gastritis, diarrhea, kidney problems and [liver cancer](#). Biologist Oluwadara Pelumi Omotayo [studied](#) how mycotoxins contaminate ginger in South Africa. We asked her to explain what they are and how to avoid the danger.

## What are mycotoxins?

Mycotoxins are [hazardous substances](#) produced by certain microorganisms called toxigenic fungi ([molds](#)).

One mold species may produce more than one type of mycotoxin, and a single mycotoxin may be produced by several mold species. Mycotoxins are ubiquitous. They can be found indoors and outdoors, thriving in warm and highly humid areas. They are usually toxic to living things.

Contamination can lead to variety of illnesses, and even death. They can cause [cancer](#), [hepatic diseases](#), deterioration of the [kidneys](#), [nephropathy](#), and [alimentary toxic aleukia](#), a potentially fatal illness marked by nausea, vomiting, diarrhea and skin inflammation. They can also impair an animal's immune system, decrease milk production, cause stunted growth and weight loss, and induce gastroenteritis.

Mycotoxins have been reported to be responsible for numerous human deaths. For example, in 2004, Kenya [recorded](#) an outbreak of aflatoxin poisoning which led to the death of about 125 people.

Mycotoxins drastically suppress the immune system. And a single

mycotoxin, even in minute quantities, can result in acute poisoning in humans and animals.

Over 300 types of mycotoxins have been identified so far, including the notable aflatoxin and other types like ochratoxin and fumonisin, which often contaminate grains like maize.

## **How do humans come in contact with mycotoxin?**

People can be exposed to mycotoxins through eating contaminated food and through contact and absorption through the skin. Exposure can also happen through inhalation of polluted air, as they can be present in airborne particles such as fungal spores.

Human exposure to mycotoxins can come from plant-based food and from the carry-over of mycotoxins and their metabolites in animal products such as meats.

Food items that can be tainted include spices, grains (such as maize, rice and sorghum), nuts, fruits (dry or fresh), coffee beans, cocoa seeds, vegetables and rhizomes like ginger.

## **Why should we be concerned about mycotoxins?**

Mycotoxin contamination is widespread, especially in African countries. The toxins exist even in [medicinal plants](#) and herbs. This was confirmed by our [study](#), which investigated the presence of mycotoxin in ginger.

Ginger has been used since antiquity for the treatment of various ailments such as colds, migraines and gastrointestinal tract disorders. However, like other spices and herbs, it has been reported to contain mycotoxins. Ginger has been found to contain aflatoxin and ochratoxin

A (which is known to be teratogenic: capable of causing developmental abnormalities in unborn fetuses).

From our study, aflatoxins B1, B2, G1 and G2 and ochratoxin A were found in ginger collected from the North-West province of South Africa in summer and winter. Though at varying concentrations, the highest concentration was observed in summer. This indicates that there's no period when crops and plants, including ginger, would necessarily be completely free from mycotoxins.

## **How do farmers and consumers know that a crop has been contaminated?**

Mycotoxins are not visible to the naked eye. The invasion of crops and foods by molds is an indication that they are potentially contaminated with mycotoxins.

Farmers and consumers should inspect food crops for evidence of molds, and discard crops and food that have mold growth.

## **What can be done to prevent mycotoxin contamination?**

To minimize the risk of mycotoxin exposure and contamination, we recommend action before and after harvest and storage.

- Prevent mycotoxin/fungi invasion while the crops are still in the field. This can be achieved by cultivating and harvesting at the appropriate time. Adopt techniques that reduce stress in plants, such as ensuring they get enough water and are well spaced. They also need adequate sunlight and should be cultivated on suitable soil. It is also important to avoid using agricultural residues as

compost as they can produce toxigenic fungi and mycotoxins when decaying.

- After harvest, reduce fungal contamination and mycotoxin production in foods during storage, handling, processing and transport. Facilities should be monitored and kept at temperatures that discourage mold growth. Crops with molds should be sorted and removed before storage. Storage facilities must be aerated and dry. Reducing [moisture content](#) in crops before storage is important to prevent mold.
- Avoid damage to grains before storing as damaged grain is more susceptible to mold growth and mycotoxin contamination.
- Don't store food too long before consumption. It is important to follow recommended guidelines for safely storing [cooked and raw food](#) in the [refrigerator](#), [fruits and vegetables](#), [grains](#), [nuts and seeds](#), and spices such as [ginger](#).
- Inspect and discard foods contaminated by molds.
- Ensure contaminated foods are not sold to consumers.
- Improve awareness about [mycotoxin](#) contamination.

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