

## MYCOTOXINS: THE HIDDEN CANNABIS THREATS

### What are mycotoxins?

Fungi are an ever-present concern in the food and feed industries; they can grow on a number of surfaces, including soil, trees, crops and a wide variety of foodstuffs. They produce a number of secondary metabolites over the course of their lifetimes, including mycotoxins, which are toxic to humans and animals. Under the right conditions, fungi proliferate rapidly, allowing mycotoxin concentrations to build to high levels. If not carefully monitored and removed, these mycotoxins can transform our foods and beverages into highly toxic consumer goods.

In a striking example of this health risk, a man in the U.S. contracted a rare and fatal fungal infection after treating chemotherapy side effects with medicinal marijuana. When tested in the lab, the marijuana samples were found to contain dangerous levels of bacteria and fungi. In another example, in Kenya several well-known brands of maize flour were removed from supermarket shelves after a large number of samples tested positive for unsafe levels of aflatoxins.

### HAZARDS

Mycotoxins are hazardous to the health of humans and animals; however, their toxicity can vary significantly, depending on the type of mycotoxin and the route of exposure to it (inhalation, ingestion or absorption), among several other variables. To date, hundreds of mycotoxins have been identified that pose a risk to human and animal health. Aflatoxins, for example, are produced by *Aspergillus* fungi and are considered carcinogenic and toxic. These mycotoxins are generally found in food, such as peanuts, maize and cannabis.

Ochratoxins, produced by the *Penicillium* and *Aspergillus* species of fungi, are also a common cannabis contaminant. Ochratoxins are considered to be carcinogenic and nephrotoxic. *Fusarium* are produced by a large number of *Fusarium* fungi and are usually found in grains that are used to produce cereal products, such as wheat and maize. The toxicity of this group ranges from toxic to fatal, depending on the specific type of *Fusarium* toxin.

### EFFECTS

The health effects of mycotoxins vary widely and are influenced by a number of factors, including length and route of exposure, mycotoxin identity, concentration, and aspects related to the body chemistry and genetic makeup of the human or animal being exposed.

Acute exposure to mycotoxins is often fatal; however, long-term exposure at lower concentrations can also cause myriad health effects, including chronic fatigue, joint pain, kidney and liver damage, immune system suppression and various carcinogenic effects.

### FOOD CONTAMINATION

Generally speaking, foods that have a high grain content are at risk of having high levels of mycotoxins. Grains such as barley, wheat and rye often contain the highest levels of mycotoxins, as well as other raw materials such as corn, sugar cane, peanuts and yeast. Therefore, finished goods produced from these items have the most risk of mycotoxin contamination. Contamination can occur at multiple points during the production process, anywhere materials are exposed to warm, humid conditions. Prior to harvest, crops can become contaminated; finished goods can

also be tainted if the production process does not effectively destroy any mycotoxins present, or if the products are transported or stored under conditions that promote mould growth. The Food and Agriculture Organisation of the United Nations estimates that 25% of the crops used for global food production are susceptible to mycotoxin contamination, which would significantly affect the quality of finished goods consumed around the world.

### CANNABIS CONTAMINATION

Unfortunately, cannabis-related products are not immune to the threat of mycotoxins. These products are derived from cannabis plants, which are susceptible to the growth of fungi which produce mycotoxins. AAs with other food and beverage products, cannabis products can become contaminated pre- or post- harvest, if the environmental conditions are sufficient to promote mould growth. Two of the primary mycotoxin groups affecting cannabis products are aflatoxins and ochratoxins. The natural stability of these mycotoxins allows them to withstand temperatures as high as 260°C (500°F), which can prevent them from being destroyed

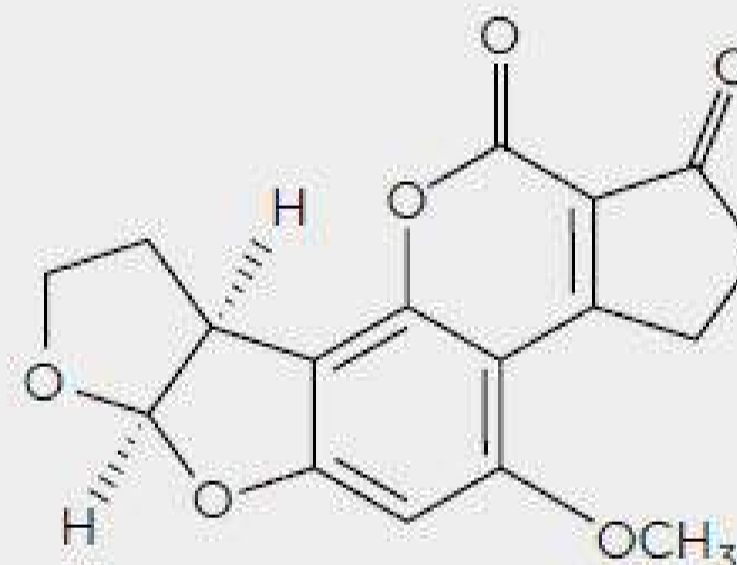
when used in cooking, or during the manufacturing processes for products such as vape liquids, oils for food, cosmetics, and emulsions for beverages.

Consumers are at greater risk for mycotoxin exposure due to a lack of cannabis regulation. In the absence of strictly defined regulations to guide manufacturers in growing, harvesting and storing crops, as well as producing and testing finished goods, mycotoxins could find their way into myriad cannabis-related consumer products.

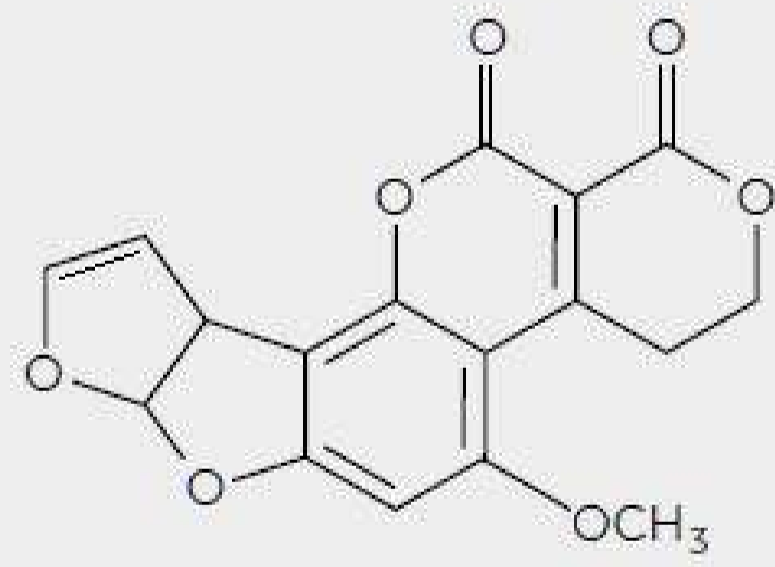
## MOST COMMON MYCOTOXINS FOUND IN CANNABIS:



**Aflatoxin B1**  
DRE-C10047100



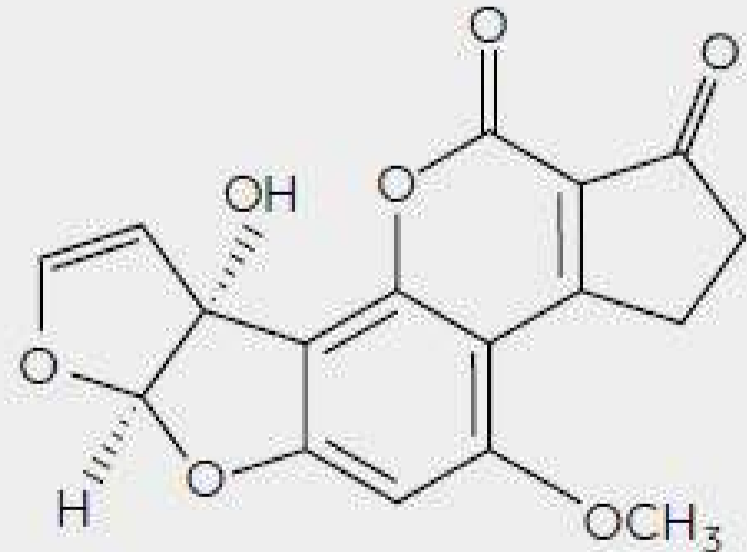
**Aflatoxin B2**  
DRE-C10047200



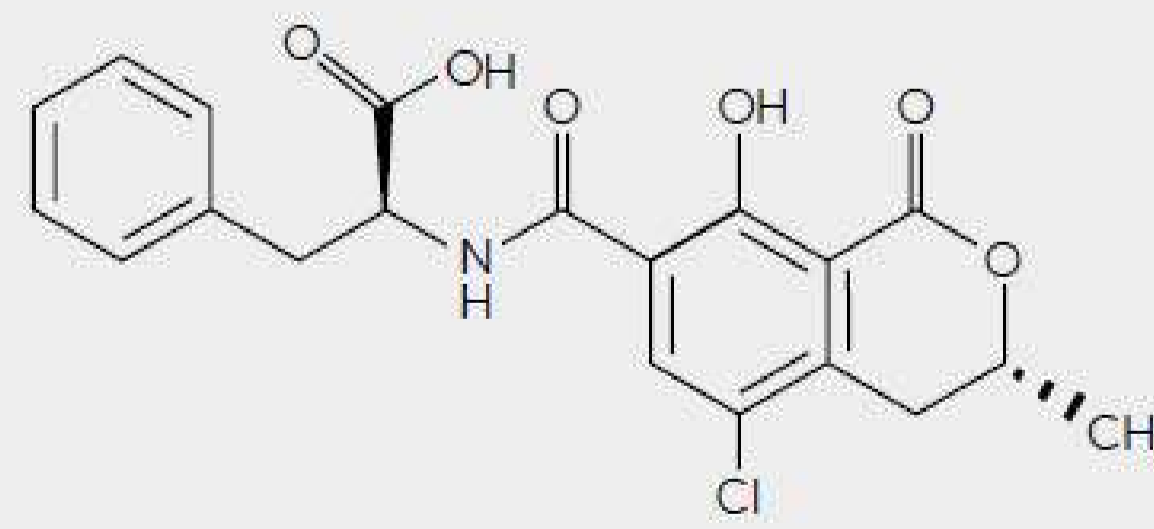
**Aflatoxin G1**  
DRE-C10047400



**Aflatoxin G2**  
DRE-C10047500



**Aflatoxin M1**  
DRE-A10047550AL-0.5



**Ochratoxin A**  
DRE-C15670000-5MG

### ANALYTICAL TESTING

As the cannabis market continues to develop, it is important to ensure the safety of consumers. Analytical testing, when used to identify potentially harmful ingredients, gives reassurance to users and allows them to be more informed on the products they are purchasing. Although methods and regulations have not been fully defined, it is always essential to use reliable reference materials for your analytical testing. We offer a broad range of mycotoxin and other cannabis-related reference materials, and with all measurements on our certificate of analysis carried out in accordance with

ISO/IEC 17025 and a majority of products produced under the scope of our ISO 17034 accreditation, we guarantee the highest quality reference materials.

Visit [lgcstandards.com](http://lgcstandards.com) to explore our complete mycotoxin portfolio, as well as over 8,000 additional Dr. Ehrenstorfer materials available for food and animal analysis, or **contact us** to explore our custom organic solutions options.