

Title Ethylene inhibits aflatoxin biosynthesis in *Aspergillus parasiticus* grown on peanuts
Author A. Gunterus, L.V. Roze, R. Beaudry and J.E. Linz
Citation Food Microbiology, Volume 24, Issue 6, September 2007, Pages 658-663
Keywords Aflatoxin; Peanuts; Ethylene; Carbon dioxide

Abstract

The filamentous fungi *Aspergillus parasiticus* and *Aspergillus flavus* synthesize aflatoxins when they grow on a variety of susceptible food and feed crops. These mycotoxins are among the most carcinogenic naturally occurring compounds known and they pose significant health risks to humans and animals. We previously demonstrated that ethylene and CO₂ act alone and together to reduce aflatoxin synthesis by *A. parasiticus* grown on laboratory media. To demonstrate the potential efficacy of treatment of stored seeds and grains with these gases, we tested ethylene and CO₂ for ability to inhibit aflatoxin accumulation on Georgia Green peanuts stored for up to 5 days. We demonstrated an inverse relationship between *A. parasiticus* spore inoculum size and the level of toxin accumulation. We showed that ethylene inhibits aflatoxin synthesis in a dose-dependent manner on peanuts; CO₂ also inhibits aflatoxin synthesis over a narrow dose range. Treatments had no discernable effect on mold growth. These observations support further exploration of this technology to reduce aflatoxin contamination of susceptible crops in the field and during storage.