



August 2020

## Aflatoxin B/G in Ginger and Nutmeg ~ Manual and Automated ~

Do you have a special matrix that we should test for mycotoxins? Please let us know and write an e-mail to: [info@LCTech.de](mailto:info@LCTech.de)

### Sample Preparation

MYCOTOXINS

#### Ginger and Nutmeg

Both ginger and nutmeg, with their diverse effects on the body, are a real miracle cure. Not only do they enchant as a spice in the kitchen, but they are also used in stress and sleep deprivation to calm down. But above all, nutmeg should be used carefully. The ingredient myristicin can put you in a state of intoxication or even lead to poisoning. Ginger is imported from India, China, Japan, Nigeria and other countries. Nutmeg is imported from South America and Africa.

During the drying process or under incorrect storage conditions, mycotoxins may form in ginger and nutmeg, e.g. Aflatoxins B/G. For this reason, regular checks are carried out when gingers and nutmegs are imported.

#### Aflatoxin B/G in Food and Feed

Aflatoxins B/G are naturally occurring mycotoxins, produced by moulds (e.g. *Aspergillus flavus*) as primary contamination in various food and feed products. The naming is based on the aflatoxins is a combination of the color of the corresponding fluorescence (Blue or Green) and the relative chromatographic mobility.

Strict legal regulations apply throughout the EU for the maximum permissible content of mycotoxins. Constant controls of our food and animal feed are therefore essential, because the consumption of excessively high levels of contamination can also lead to chronic health problems for humans and animals.

LCTech supports you in your daily laboratory routine with a range of well designed, reliable products at reasonable prices: From immunoaffinity columns and derivatization devices to a system for fully automated mycotoxin analysis.

Did you know that the protocols of the AflaCLEAN columns are also compatible with the AflaCLEAN SMART can be processed - only faster and with less solvent ?



AflaCLEAN and  
AflaCLEAN SMART

## Processing Protocol

Homogenise 10 g of ginger or nutmeg with 2 g of sodium chloride. Extract the sample with 100 mL methanol/water (80/20/ (v/v)) and 50 mL n-hexane in order to remove fat and oil. For high extraction efficiencies, continue the extraction (depending on extraction device) for at least 10 minutes.

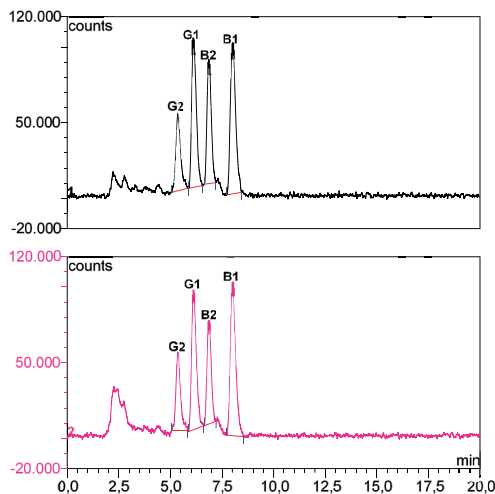
Filtrate the raw extract and dilute 2 mL with 12 mL PBS (contains 8 % Tween20). Load 14 mL of the sample (corresponds to 0.2 g matrix) onto an AflaCLEAN column. Wash the column with 2 x 5 mL deionized water, dry the column by flushing air through it and use the washing solution to rinse the sample reservoir.

Elute the toxin with 2 mL methanol. Ensure that the methanol acts in the column bed for 5 minutes to ensure complete denaturation of the antibodies and release of the toxin.

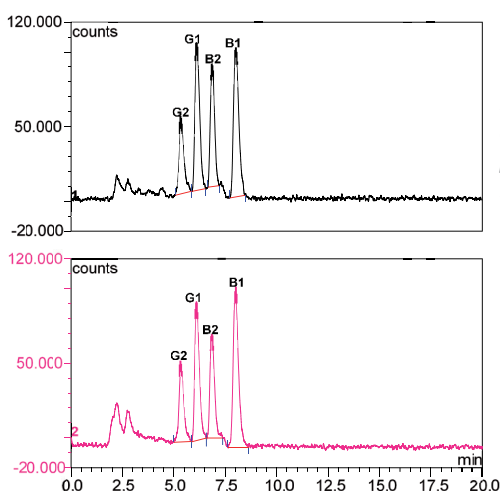
Dilute the eluate to HPLC conditions by adding HPLC water and acetonitrile. Inject a maximum of 100 µL into the HPLC. Due to the effective purification, the sample can also be analyzed by LC-MS/MS ESI. For this purpose, appropriate running conditions and ionization settings must be selected.

HPLC-Conditions	
Aflatoxin B/G	
HPLC:	isocratic
Column Oven:	36 °C
Separation Column:	RP C-18 (P/N 10522)
Flow Rate/ Eluent:	1.2mL/min; HPLC-water/methanol/ acetonitrile (60/30/15 (v/v/v))
Flourescence Detection:	Derivatization with UVE Photochemical Reactor
Excitation Wavelength:	365 nm
Emission Wavelength:	460 nm

## Chromatograms



*Black: Standard corresponds to 8 ng aflatoxin B1/G1 and 2 ng aflatoxin B2/G2 per gram of sample weight*  
*Red: Ginger (spiked with aflatoxin)*



*Black: Standard corresponds to 8 ng aflatoxin B1/G1 and 2 ng aflatoxin B2/G2 per gram of sample weight*  
*Red: Nutmeg (spiked with aflatoxin)*



Recovery Rates				
Content of Aflatoxin B1, B2, G1 and G2 in Ginger and Nutmeg				
Aflatoxin	B1	B2	G1	G2
Standard*	100	100	100	100
Recovery Rate** Ginger 20 ppb	100	83	94	89
Recovery Rate** Nutmeg 20 ppb	100	87	95	88

\* Standard was set = 100% , \*\* Corrected with non-spiked sample / The results are in accordance with the performance specifications of the EC 401 / 2006 (section 4.3.1).

## These LCTech Products were used:

AflaCLEAN Immunoaffinity Columns for Aflatoxin B/G  
P/N 10514 / 11721

HPLC Separation Column RP C-18  
P/N 10522

C 18 precolumn holder for mycotoxin analysis  
P/N 10750

Guard Column, Reversed Phase, C18  
P/N 10523

UVE Photochemical Reactor  
P/N 10519