Matrix
of the Month

Aflatoxins B/G in Cinnamon:
fully automated via FREESTYLE ThermELUTE™

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

Sample Preparation and Analysis

MYCOTOXINS

Aflatoxins are naturally occurring mycotoxins, which are highly toxic for humans and animals. They are produced by mold (e.g. Aspergillus flavus) as primary contaminants in various food and feed. Aflatoxins are found in nuts (e.g. peanuts, pistachio), corn and many other foodstuffs. Especially for this application field LCTech deleveped the immunoaffinity column AflaCLEAN SMART. The columns guarantee best results even for difficult matrices. The processing is particulary easy in combination with the FREESTYLE robotic system for fully automated sample preparation, day and night, including weekends.

Fully Automated, Sensitive, SMART

Automated Processing with FREESTYLE ThermELUTE™

The FREESTYLE system is combined with a SPE module and a ThermELUTE™ module. In this configuration, the convenient SMART immunoaffinity columns are processed fully automated in a very short period of time. The sample is directly eluted into an HPLC sample loop. Losses through evaporation or adsorption effects (e.g. with aflatoxins) are thereby avoided.
FREESTYLE SPE in combination with ThermELUTE™ and SMART columns are the core elements for complete automation. No other device reduces workload, while ensuring a constant increase of sample throughput at the same time.

SMART columns - small insize, but yet the solution for high throughput in the analysis of aflatoxin B1, B2, G1, G2, and M1 or ochratoxin A in food and feed. Extract, filtrate and dilute the eluent according to the processing protocol. Put your samples into the FREESTYLE, equip the racks with the SMART columns, configure the required method in the easy to operate software and press the start button. From now on the processing is taken over by the FREESTYLE system resulting in a finished chromatogram.
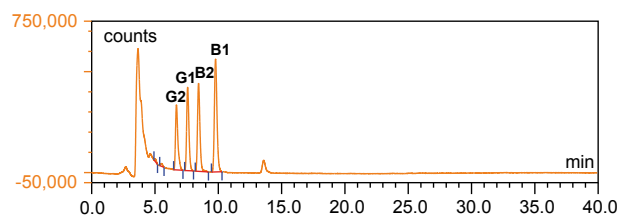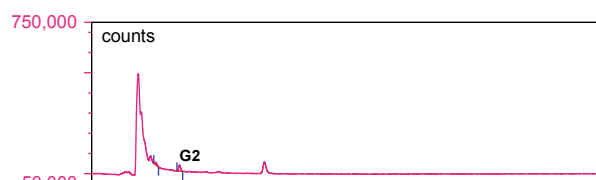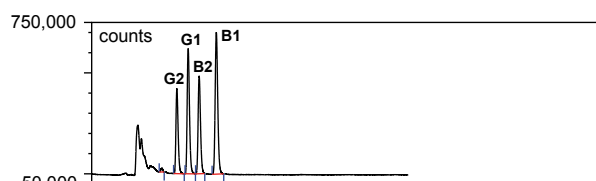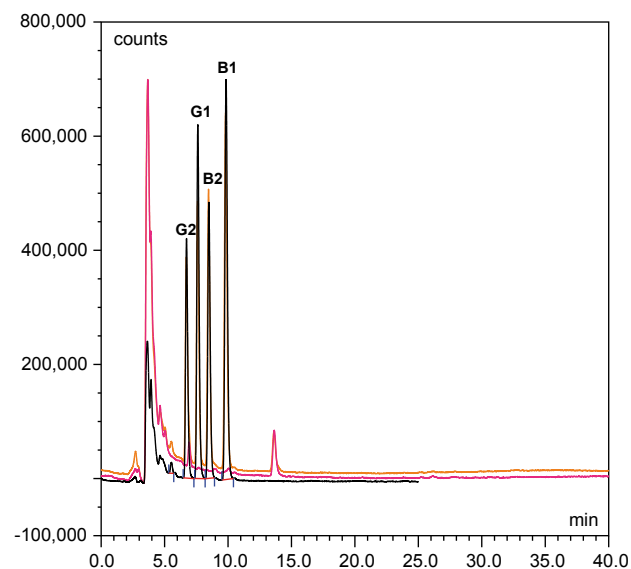

Robotic system FREESTYLE ThermELUTE™ with SPE module for fully automated sample preparation and analysis of mycotoxins

Matrix
of the Month

Processing Protocol

Use 10 g of homogenised cinnamon and add 2 g of sodium chloride. Extract it with 100 mL methanol/water (80/20 (v/v)) and 50 mL of n-hexane to remove fat and essential oils. The extration should be conducted for at least 30 minutes, to avoid lowering extraction efficiencies. Filtrate the raw extract anddilute 2 mL with 12 mL PBS (containing 8 % Tween).

After positioning the samples into the FREESTYLE ThermELUTE™, the system loads 2.8 mL onto the AflaCLEAN SMART column. The column will be washed automatically with 2 mL of de-ionised water, eluted via ThermELUTE™ technology. Finally the sample will be directly injected into the HPLC.

The results are excellent, high-resolution chromatograms of maximum 15 minutes timeframe.

HPLC-Conditions
(Aflatoxins B/G)

HPLC:	isocratic
Column Oven:	36°
Separation Column:	RP C-18 (P/N 10544)
Flowrate:	1.2 mL/min
Eluent:	HPLC-water/methanol/ acetonitrile (60/30/15 (v/v/v))
Fluorescence Detection:	with derivatisation (UVE/photochemical)
Excitation Wavelength:	365 nm
Emission Wavelength:	460 nm

Recovery Rates
Content of Aflatoxin B1, B2, G1 and G2 in Cinnamon

Aflatoxin	B1	B2	G1	G2
Standard*	100	100	100	100
Recovery Rate** Cinnamon, 10 ppb	100	105	85	73

*Standard is set = 100 %, **Corrected with non-spiked sample/
The results correspond to the performance specifications of EC 401/2006 (Section 4.3.1)

*Immunoaffinity columns
AflaCLEAN SMART with needles*

These LCTech products were used:

AflaCLEAN SMART Immunoaffinity Column
for Aflatoxins B1, B2, G1, G2 and M1
P/N 12862 / 12863

FREESTYLE ThermELUTE™ Robotic System
for Sample Preparation and Analysis
P/N 12663 / 12668 / 13691

Black: Standard (represents 10 ppb (0.04 g matrix equivalent))
Red: Cinnamon not spiked, Orange: Cinnamon spiked with 10 ppb

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LCTech GmbH, Bahnweg 41, 84405 Dorfen, Germany, Tel. +49 8081 9368-0, Fax +49 8081 9368-10, mycotoxins@LCTech.de, www.LCTech.de

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