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Aflatoxins B/G in Corn Comparison: Manual and Automated Processing

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 in Corn

Aflatoxin B1 is the most dangerous mycotoxin to human among all aflatoxins. As consequence to repeating exceedance of the maximum content of aflatoxin B1 in corn samples from different countries, the ad-hoc monitoring plan has been implemented in 2012. It divides the countries of origin in different categories (high, medium, low risk). Every QS-certificated company, which obtains corn or corn-processing products, must strictly follow the directives given. [Source: Ad-hoc monitoring plan for aflatoxin B1 in corn, QS Quality and Safety GmbH, Bonn]

Automated Sample Preparation around the Clock **Precise, simple and fast with LCTech products**

LCTech supports you in your daily laboratory routine with a whole range of reliable and high quality products at favorable prices: from immunoaffinity columns and devices for derivatisation up to complete robotic systems for fully automation in mycotoxin analysis.

Our systems processes your samples by day, night and even at weekends - reliable and unattended. Each manual method, already proved at your laboratory, can be transferred to automation on the robotic system FREESTYLE SPE. That gives you more time for other important activities.

On the following page we compare the fully automated processing via FREESTYLE SPE and the manual processing with a protocol, recovery rates and a chromatogram.



Processing Protocol

Preparatory Steps for the Following Processing

Extract 20 g homogenised corn with 100 mL methanol/water (80/20 (v/v)). The extraction should be performed for 10 minutes. Filtrate the raw extract through a glass fibre filter (Whatman GF/A), in order to remove turbidities and precipitations.

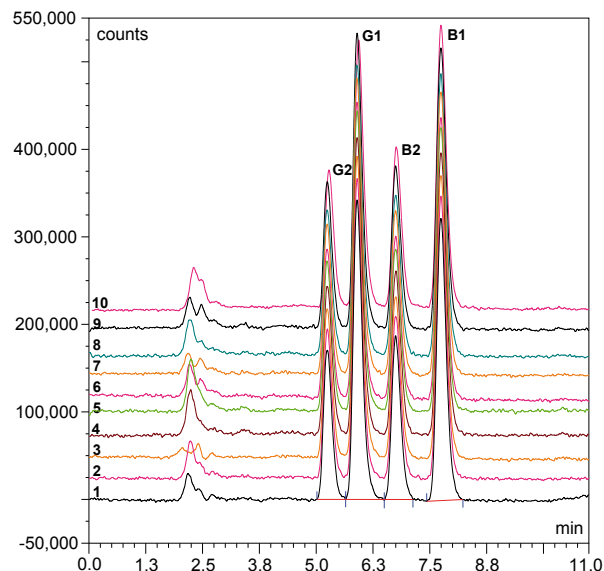
Manual Processing

Dilute 7 mL sample with 43 mL PBS and load 25 mL sample onto the immunoaffinity column AflaCLEAN. Wash the column with 10 mL deionized water and dry it afterwards by flushing air through it. Elute the toxin with 2 mL methanol. Keep in mind that the column bed is incubated with methanol for 5 minutes in order to ensure a fully denaturation of the antibodies and release of toxins.

Automated Processing with FREESTYLE SPE

For automated processing put the sample in the FREESTYLE SPE, parameterize the method with a few mouse clicks in the software and start the system. You can save the method in the system or you can adapt it anytime for other applications.

Reproducible Results



Overlay of 10 corn chromatograms processed via FREESTYLE SPE

Conclusion: In Comparison

The recovery rates and the chromatogram of manual and automated processing show, that the results, achieved by the robotic system FREESTYLE SPE, are reliable and reproducible. The clean-up of aflatoxins B/G can thus be automated easily via FREESTYLE SPE.

Every manual method can be easily transferred to automation - you only need a few clicks in the software of the FREESTYLE system. Your samples can be processed unattended, reproducibly and around the clock.

HPLC-Conditions (Aflatoxin B/G)

HPLC:	isocratic
Column Oven:	36 °C
Separation Column:	RP C18 (P/N 10544)
Flow Rate:	1.2 mL/min
Eluent:	HPLC-water/methanol/ acetonitrile (60/30/15 (v/v/v))
Fluorescence Detection:	Photochemical derivatisation with UVE Reactor
Excitation Wavelength:	365 nm
Emission Wavelength:	460 nm

Recovery Rates FREESTYLE SPE Content of Aflatoxin B/G in Corn

Mycotoxin	B1	B2	G1	G2
Standard*	100	100	100	100
Recovery Rate** Corn, 12 ppb n = 10 Columns (Mean Value)	100	99	100	97
Relative Error in %	4	4	4	4

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

Recovery Rates Manual Processing Content of Aflatoxin B/G in Corn

Mycotoxin	B1	B2	G1	G2
Standard*	100	100	100	100
Recovery Rate** Corn, 12 ppb n = 8 Columns (Mean Value)	101	98	102	100

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

These LCTech products were used:

AflaCLEAN,
Immunoaffinity Columns for Aflatoxins B/G
P/N 10514 / 11721

Separation Column RP C18
P/N 10544

UVE for Photochemical Derivatisation
P/N 10519

FREESTYLE SPE, Robotic System
for Automated Sample Preparation
P/N 12663 / 12668