Matrix of the Month

October 2018

Aflatoxins B/G in Dried Distillers Grains with Solubles (DDGS) ~ 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: mycotoxins@LCTech.de

Sample Preparation

MYCOTOXINS

Feed

In the production of bioethanol based on cereals containing starch, mash is a by-product. In most cases, this is maize and wheat, but other plant sources can also be used to produce bioethanol or energy in general. Pelleted and dried, the mash becomes DDGS (Dried Distillers Grains with Solubles).

DDGS is mainly used as feed for livestock, preferably for fattening, as it is extremely nutritious due to its very high protein and energy content. Within Germany, however, the feed is not yet widespread, it is primarily used in the USA, whereby it is the third most common protein feed for farm animals worldwide after soya and rapeseed.

Mycotoxins in Food and Feed

What the human eye cannot see are the dangers that can often lurk in our food and feed. Mycotoxins that have already been produced in the field and processed afterwards can be rediscovered in the end product - however, only analytically measurable instead of visible.

EU-wide regulations on the permissible content of mycotoxins and constant controls of our food and feed are therefore indispensable, because the consumption of too high levels of contaminants can lead to serious health damage in both humans and animals.

LCTech supports you in your daily laboratory routine with a range of clever, reliable products at reasonable prices: from immunoaffinity columns and derivatisation devices up to a system for the complete automation in the mycotoxin analysis.

... and how quick and easy you can transfer manual methods to automation, you`ll find out at www.LCTech.de.

Matrix of the Month

Manual Processing Protocol

Homogenise 10 g of Dried Distillers Grain with Solubles (DDGS) and add 1 g of sodium chloride. Extract the mix with 50 mL of pre-cooled* methanol/water (80/20 (v/v)). In order to remove fat, add 25 mL of pre-cooled* n-hexane during the extraction. Perform the extraction for 30 minutes to ensure high extraction efficiencies.

**Pre-cool the extraction solutions in order to avoid residual enzymatic activities.*

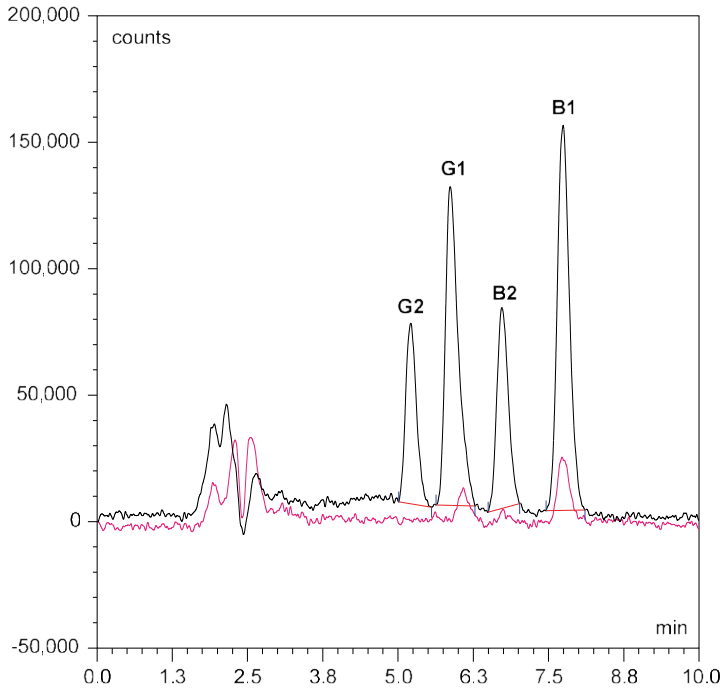
Filtrate the raw extract and dilute 2 mL with 12 mL PBS (contains 8 % Tween). In case of precipitations, filtrate the sample again through a Whatman glass fiber filter. Afterwards, load 14 mL of sample (represents 0.4 g matrix) onto an AflaCLEAN immunoaffinity column. Wash the column with 10 mL of deionised water.

Elute the aflatoxins with 2 mL of 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.

HPLC-Conditions
(Aflatoxins B/G)

Mycotoxin:	**Aflatoxins B/G**
HPLC:	isocratic
Column Oven:	36 °C
Separation Column:	RP C-18 (P/N 10522)
Flow Rate:	1.2 mL/min
Eluent:	HPLC-water/ methanol/acetonitrile (60/30/15 (v/v/v))
Fluorescence Detection:	Photochemical derivatization with UVE
Excitation Wavelength:	365 nm
Emission Wavelength:	460 nm

Chromatograms



Black = DDGS spiked with 20 ppb aflatoxins (8 ppb aflatoxin B1/G1; 2 ppb aflatoxin B2/G2)

Red = DDGS not spiked

Recovery Rates
Content of Aflatoxin B/G in DDGS

Aflatoxins B/G	B1	B2	G1	G2
Standard*	100	100	100	100
Recovery Rate DDGS, 20 ppb**	99	83	100	75

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

These LCTech products were used:

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

UVE, Photochemical Reactor
P/N 10519

HPLC Separation Column RP C-18
P/N 10522

FREESTYLE SPE, Robotic System for Automated Sample Clean-up
P/N 12663 / 12668

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