



November 2020

Aflatoxins B/G in Rice ~ 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

Sample Preparation

MYCOTOXINS

Rice

Rice is one of the most important crops in the world. Rice is a staple food for around half the world's population and the demand is increasing every year. The rice plant belongs to the grass family and through breeding there are already about 8000 different rice varieties. 90 percent of the world's rice production is grown in Asia - in some Asian countries it is even still grown by hand in typical rice terraces. Italy is the largest rice producer in Europe.

After harvesting, the rice is threshed, dried and cleaned, as it is common for many types of grain. If the husk is removed, the brown natural rice is ready to eat. For the usual white grain, silver skin and germ are removed.

Small + Fast + Economical = SMART



AflaCLEAN 3 mL and
AflaCLEAN SMART

During drying or further processing of the rice plant, mycotoxins can be produced by incorrect conditions, which can be toxic to humans but also to animals. For this reason, strict legal regulations apply throughout the EU regarding the maximum permissible level of mycotoxins in food and feed.

Rice is also regularly tested for aflatoxins B/G before import. The challenge many laboratories have to face nowadays is to be able, to process many samples as quickly as possible.

To facilitate this task LCTech has developed the immunoaffinity column AflaCLEAN SMART. The SMART columns do not only convince by their small size, but also save your money. Reduced solvent usage, shorter processing times and with very good recovery rates.

1/5 Time, 1/5 Solvent and 1/5 Waste = 100 % Performance

Processing Protocol

Homogenise 20 g of rice and extract the sample by 100 mL methanol/water (80/20 (v/v)). For high extraction efficiencies, continue the extraction for at least 10 - 20 minutes.

With AflaCLEAN

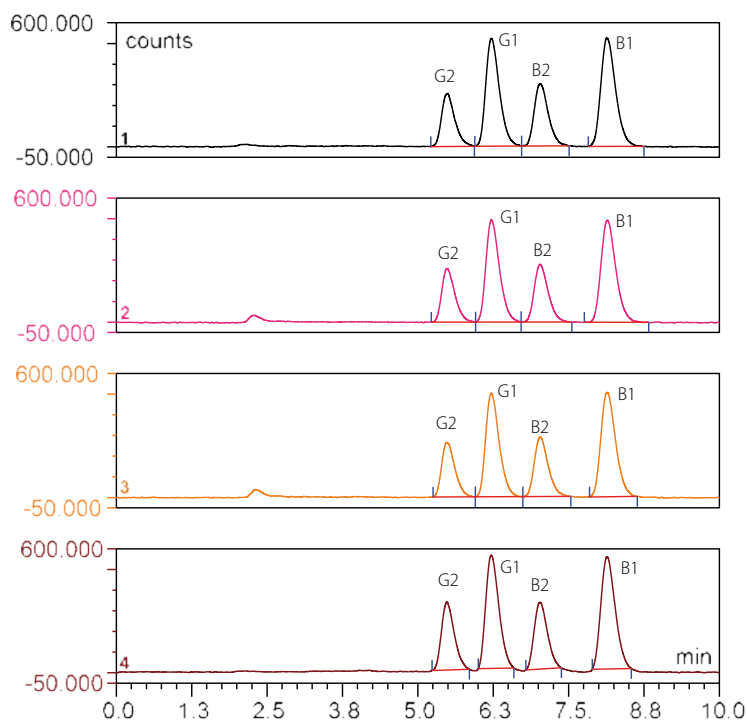
Filtrate the raw extract and dilute 7 mL with 43 mL PBS. Load the sample onto the AflaCLEAN immunoaffinity column. Wash the column with 10 mL water. Dry the column by flushing air through it. Elute the toxins with 2 mL methanol.

With AflaCLEAN SMART column

Filtrate the raw extract and dilute 7 mL with 43 mL PBS. Load 10 mL of the sample onto an AflaCLEAN SMART immunoaffinity column at a flow rate of 3 mL/min. Wash the column with 2 mL water. Dry the column by flushing air through it. Elute the toxins with 400 µL methanol.

Ensure that the methanol incubates in the column bed for 5 minutes to completely denaturate the antibodies and release the toxins.

Chromatograms



Black: Rice, 20 ppb clean-up with AflaCLEAN

Red: Rice, 20 ppb clean-up with AflaCLEAN SMART

Orange: Rice, 20 ppb clean-up with AflaCLEAN SMART

Brown: Standard 20 ppb (28ng/2mL)



Fast, very good recoveries and reproducible results

HPLC-Conditions

Aflatoxins 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:	With photochemical reactor UVE
Excitation Wavelength:	365 nm
Excitation Wavelength:	460 nm

Recovery Rates

Content of aflatoxins B1, B2, G1 und G2 in rice

Aflatoxins	B1	B2	G1	G2
Standard*	100	100	100	100
Recovery Rate** Rice, 5 ppb with AflaCLEAN	95	90	94	83
with AflaCLEAN SMART	93	92	95	86
Recovery Rate** Rice, 10 ppb with AflaCLEAN	98	98	98	84
with AflaCLEAN SMART	95	92	95	84
Recovery Rate** Rice, 20 ppb with AflaCLEAN	100	101	100	83
with AflaCLEAN SMART	96	95	95	86
Recovery Rate** Rice, 40 ppb with AflaCLEAN	95	94	95	80
with AflaCLEAN SMART	98	97	98	89

* 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

AflaCLEAN SMART Immunoaffinity Columns for
Aflatoxin B/G
12862 / 12863

HPLC Separation Column RP C-18
P/N 10522

UVE Photochemical Reactor
P/N 10519