



SMART & Fast Clean-Up of Aflatoxins

Speed up your sample clean-up to improve mycotoxin analysis



Nuts and peanuts are often effected by mold due to storage conditions and moisture content. The testing of commodities become more time consuming and difficult due to the inhomogenous distribution of mycotoxin in such commodities. An increase of sub samples could help to overcome this. To achieve this reduced processing time in sample clean-up is indispensable. The AflaCLEAN SMART offers the chance to reduce sample clean-up time to less than 10 minutes without losing sensitivity or matrix compatibility and is combinable with analytics (HPLC-FLD or LC-MS/MS).

Also it enables the reduction of matrix impurities and improvement of analytical sensitivity for all kind of matrices. Cleaned-up samples could be even applied on low-tech analytical measurements, the gain of sensitivity and matrix reduction could improve these techniques as well.

Product Highlights

The AflaCLEAN SMART is designed to speed up sample clean-up. High sample throughput, testing of sub samples and keeping analytical sensitivity on the highest level in less than 10 minutes.

Advantages at a glance:

- Miniaturized cartridge design
- Quality approved analyte selectivity with highest binding capacity
- Flexible use due to matrix adapted extraction and clean-up protocols

Processing Protocol

Extract 20 grams of homogenised sample material with 100 ml methanol/water (80/20 (v/v)), efficient defatting can be performed by adding 50 ml n-hexane. After extraction, the crude extract is filtered or insoluble material is precipitated by centrifugation. Phase separation could be done, for further steps only the bottom phase after filtration is used.

3.5 mL crude extract is diluted with 21.5 mL pbs buffer. In case of inconsistency, filtration with a Whatman GF/A prevents clogging or higher backpressure in the loading

process. Add up to 10 mL (0.28 grams matrix equivalent) to the AflaCLEAN SMART cartridge at a flow rate of max. 3 mL/min.

Wash non-specifically bound matrix impurities from the column with 2 mL deionised water. Dry the column bed material by flushing it with air. Elute the analytes with 0.4 mL methanol, which acts for at least 5 minutes in the column bed to denature the antibody and release the analyte quantitatively. The eluate can be further processed by dilution with HPLC water or used for direct injection into HPLC-FLD or LC-MS/MS.



AflaCLEAN SMART



Results

Good and easy-to-interpret chromatographic results with excellent recoveries were obtained in the investigation of various peanut-based foods (figure 1-3). For all matrices, the aflatoxin content found was corrected for the calculation of the recovery. The homogeneity of the recovery and the efficiency of the extraction were checked by parallel tests (n=5)*. The rapid clean-up allows an improvement of the sample throughput and helps to solve the problem of inhomogeneity of aflatoxin contamination in food. The AflaCLEAN SMART allows quantitative clean-up of different matrices (peanut, peanut butter, peanut flour) Excellent recovery rates were observed for all aflatoxins. complying with all regulatory standards.

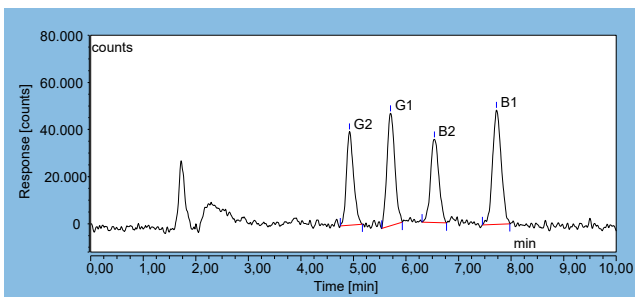


Figure 1: Shelled peanut spiked with 7 ppb, analysed by HPLC-FLD with postcolumn derivatisation by photo chemical reactor UVE.

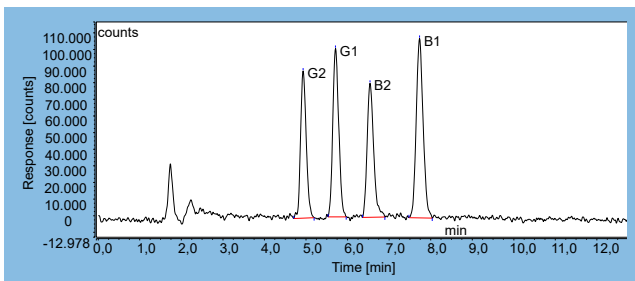


Figure 2: Peanut butter spiked with 20 ppb, analysed by HPLC-FLD with post column derivatisation by photochemical reactor UVE.

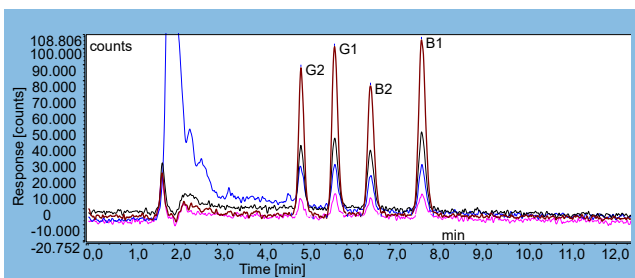


Figure 3: Overlay of spiked peanut samples (2 ppb (pink), 5 ppb (blue), 7 ppb (black), 20 ppb (brown)), consistent and baseline separated chromatography could be achieved.

HPLC conditions

HPLC	isocratic
column oven	36
HPLC column	PN 10522
Flow rate / solvent mixture	1.2 ml/min (60/30/15 (HPLC-water/methanol/acetonitrile))
Fluorescence detection	Post column derivatisation by UVE (photochemical) (PN 10519)
Excitation wavelength	365 nm
Emission wavelength	460 nm

Recoveries

Matrix	Spiking Level (total aflatoxin)	Recovery (%) (B1/G1/B2/G2)*
Peanut with shell	5 (µg/Kg)	99/98/99/96
Peanut with shell	7 (µg/Kg)	97/97/97/98
Peanut with shell	20 (µg/Kg)	98/98/99/99
Peanut w/o shell	5 (µg/Kg)	94/96/99/91
Peanut w/o shell	7 (µg/Kg)	98/94/98/99
Peanut w/o shell	20 (µg/Kg)	96/95/97/92
Peanut butter	5 (µg/Kg)	92/94/98/91
Peanut butter	7 (µg/Kg)	96/93/93/95
Peanut butter	20 (µg/Kg)	99/91/96/92
Peanut flour	5 (µg/Kg)	98/94/96/91
Peanut flour	7 (µg/Kg)	99/96/95/93
Peanut flour	20 (µg/Kg)	99/94/94/97

Conclusion

The AflaCLEAN SMART provides a reliable approach to analyse various peanut samples for aflatoxins. The fast and easy handling, flexibility in application and solvent saving techniques allow accurate analysis of various matrices in less than 10 minutes. The high sample throughput can be combined with HPLC-FLD or LC-MS/MS but even applicability in other analytical approaches provide a SMART way of aflatoxin analysis. A full automation process is available and allows up to 10fold higher sensitivity of the aflatoxin analysis.

Do you have a special request as to which matrix we should test for you?
Contact us by e-mail at: info@LCTech.de

These LCTech products were used:

12862/12863 AflaCLEAN SMART (100/1000 column/pc)
10522 mycotoxin HPLC column