



# Aflatoxin analysis of almond and sesame products



Almonds and sesame seeds are very often contaminated with aflatoxins. If they exceed the legal limits, they are withdrawn from the market or not permitted for trading.

To prove compliance with regulatory guidelines, an hplc-fluorescence or mass spectrometric analysis is “gold standard” and established in many official methods.

Mycotoxins are among the most frequently found contaminants in food and feed complaints. Due to their toxicity, the regulated limits are low and sample clean-up is essential to detect and quantify low toxin concentrations.

The AflaCLEAN columns provide an extremely qualitative, robust and sensitive tool for mycotoxin clean-up of foodstuff.

## Highlights

- Excellent cleaning and concentration properties
- High loading capacity and good recovery rates
- Compatible with LC-MS/MS / HPLC-FLD / fluorometrical analysis
- Multiple compatibility with food and feed matrices
- Long shelf life: 24 months from production date

## Experimental procedure

Extract 20 g of the homogenized material by adding 2 g sodium chloride, 100 mL methanol/water (80/20 (v/v)) and 50 mL n-hexane and defat by mixing for at least 15 minutes. Filter the crude extract by a plaited filter. To achieve adequate separation of the n-hexane from the methanolic phase, a centrifugation at 3000 xg is recommended. The bottom phase (methanolic) is used and 10.5 mL are diluted by 64.5 mL pbs buffer. In case of turbidity, filter the diluted sample with a whatman GF/A glass fiber filter. Apply 50 mL (1,4 gram) onto the

AflaCLEAN immuno affinity column at a maximum flowrate of 2 mL/min. After loading the sample, wash the sample reservoir twice with 5 mL of deionized water, which is loaded onto the AflaCLEAN column. Dry the column by flushing air through it. To elute the analytes, pipette 2 mL of methanol onto the column bed and let it soak for at least 5 minutes. Collect the eluate and prepare it for HPLC-FLD analysis.



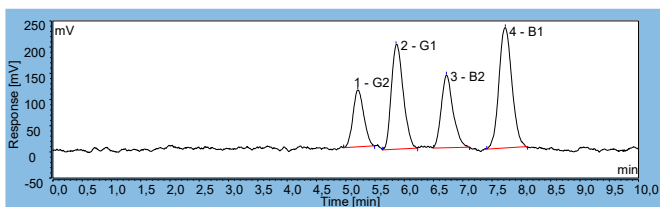
AflaCLEAN column



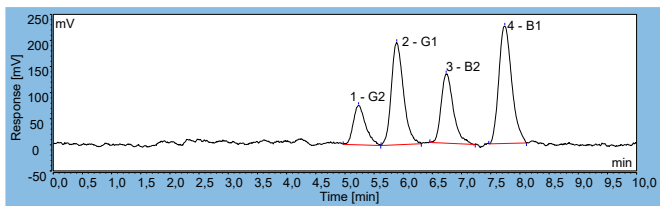
## Results

Chromatographic separation according to LC conditions allows analysis within 10 minutes and provides excellent chromatographic resolution for all aflatoxins. Almond butter (second chromatogram) shows a similar appearance as sesame paste (bottom chromatogram) and is highly comparable to the aflatoxin standard (top chromatogram).

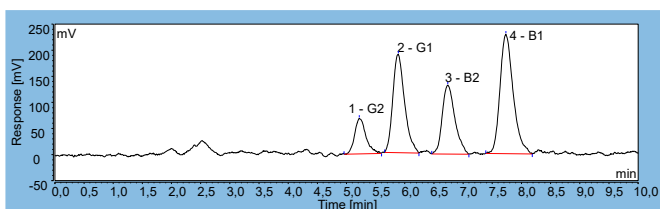
Excellent recovery rates for all aflatoxins provide a robust and sensitive basis for aflatoxin analysis. Especially in areas where aflatoxins are increasingly found, robust and qualitative clean-up methods are helpful to ensure food quality.



Standard aflatoxins (14ng/2mL) (10ppb total aflatoxin (4ppb AFB1))



Almond butter 10 ppb total aflatoxin (4ppb AFB1)



Sesame paste 10ppb aflatoxin (4ppb AFB1)

## Conclusion

The AflaCLEAN cartridge is an ideal tool to analyse and quantify aflatoxins from these commodities and to improve the accurate and sensitive aflatoxin analysis. High loading capacities (up to 1.4 grams) enable good analysis and improved measurement sensitivity.

### LC-conditions

LC-conditions	Aflatoxin B/G
Solvent (water/methanol/acetonitrile)	60/30/15
Flowrate (mL/min)	1.2
Column	PN 10522
Column temperature	36 °C
Fluorescence Ex.	365 nm
Fluorescence Em.	460 nm
Post column derivatisation	UVE

### Analyte

Analyte	Almond butter	Sesame paste
Aflatoxin B1	95	95
Aflatoxin B2	95	92
Aflatoxin G1	100	97
Aflatoxin G2	83	81



## Photochemical derivatization

Derivatization of aflatoxins with UV light by LCTech UVE enables the analysis of aflatoxins with HPLC fluorescence in the simplest possible way. The low inherent fluorescence of aflatoxins B1 and G1 makes derivatization necessary for fluorescence analysis in order to comply with the analytical limits. This is easy to implement, conveniently and cost-effectively with the UVE by photochemical irradiation with UV light at 254 nm, resulting in improved fluorescence with a gain of sensitivity for Aflatoxin B1/G1 at least by a factor of 10. No additional reaction reagents need to be added.

### These LCTech products were used:

10514/11721	AflaCLEAN™ column (25 / 500 per pck)
10519	UVE photochemical derivatization
10522	Mycotoxin HPLC column

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