Clean-Up Columns

AflaCLEAN™, OtaCLEAN™, Afla-OtaCLEAN™ & DONex™ Clean-Up Columns

Immunoaffinity & SPE Sample Clean-Up Columns

Aflatoxins and Ochratoxin A are produced by fungi, e.g. Aspergillus and Penicillium species. Therefore both toxin types are found together in many foods and animal feeds, e.g. cereals. Deoxynivalenol, also known as Vomitoxin, is a metabolite of various molds of the genus Fusarium (F. colmorum, F. graminearum) and can often be found together with other mycotoxins.

Of significant assistance is the clean-up of extracts by a combined immunoaffinity column (the Afla-OtaCLEAN column) for both Aflatoxins and Ochratoxin A in one step. The subsequent analysis may then be performed by HPLC with post-column derivatization or other techniques.

Simultaneous Clean-Up of Aflatoxins and Ochratoxin A

The combination sample clean-up column Afla-OtaCLEAN™ from LCTech is very tolerant towards many matrices and allows for a comprehensive clean-up of the aflatoxins B1, B2, G1 and G2 as well as Ochratoxin A. The high maximum capacity of 150 ng for Aflatoxin B1 and 200 ng for Ochratoxin A provides a wide measurement range. With a shelf-life of 1 year (from date of manufacture) at room temperature, the storage and use of the columns is very convenient.

Example Recoveries of Aflatoxin and Ochratoxins					
Matrix	B1	B2	G1	G2	OTA
Maize (Afla 10 ppb, OTA 14.3 ppb)	107 %	91 %	103 %	75 %	97 %
Rice (Afla 10 ppb, OTA 14.3 ppb)	107 %	93 %	98 %	85 %	101 %
Malt (Afla 10 ppb, OTA 14.3 ppb)	98 %	99 %	97 %	70 %	96 %
Raisins (Afla 10 ppb, OTA 14.3 ppb)	99 %	106 %	101 %	69 %	97 %

Aflatoxins & Ochratoxin a Sample Clean-Up Column	
11022	Afla-OtaCLEAN™, Aflatoxins B1, B2, G1, G2 & Ochratoxin A, Pkg 25, 18 month* shelf life at room temp. (Minimum order of 20 packs)
11771	Afla-OtaCLEAN™, Aflatoxins B1, B2, G1, G2 & Ochratoxin A , Pkg 500, 18 month* shelf life at room temp (Minimum order of 4 packs)

Sample Clean-Up Column for Aflatoxin Analysis

AflaCLEAN™ from LCTech was developed for the sample clean-up of foods, grains, feeds, etc. for aflatoxin analysis using HPLC post-column derivatization or other techniques. The AflaCLEAN™ column is selective for B1, B2, G1 and G2. The maximum loading capacity is 150 ng of Aflatoxin. The shelf-life is 2 years (from date of manufacture) at room temperature. Our cost-effective AflaCLEAN Select columns have a shelf-life of 9 months at 4 °C.

Example Recoveries of Aflatoxin				
Matrix	B1	B2	G1	G2
Peanut Butter	95 %	98 %	93 %	84 %
Peanuts	104 %	94 %	96 %	85 %
Dried Distillers Grain	109 %	97 %	90 %	77 %
Maize	101 %	98 %	103 %	80 %

Aflatoxin Sample Clean-Up Column	
Catalog No.	Description
10514	AflaCLEAN™, Aflatoxins B1, B2, G1, G2, Pkg 25, 24 month* shelf life at room temp.
12058	AflaCLEAN™ SELECT, Aflatoxins B1, B2, G1, G2, Pkg 25, 9 month* shelf life at 4 °C (Minimum order of 20 packs)
12062	AflaCLEAN™ SELECT, Aflatoxins B1, B2, G1, G2, Pkg 25, 9 month* shelf life at 4 °C (Minimum order of 20 packs)

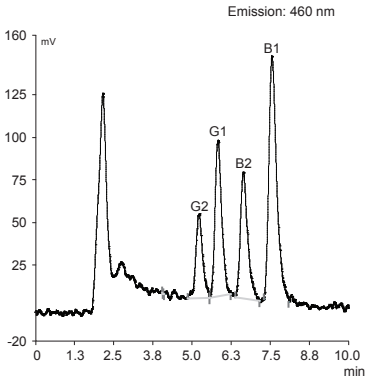
* From date of manufacture

Clean-Up Columns

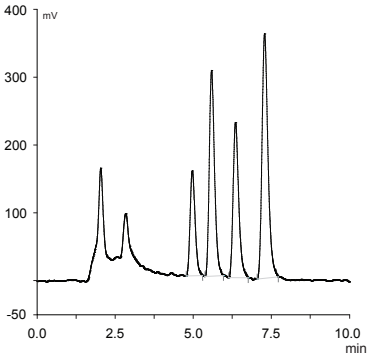
AflaCLEAN Select Columns	
Catalog No.	**Description**
12058	AflaCLEAN™ SELECT, Aflatoxins B1, B2, G1, G2, Pkg 25, 9 month* shelf life at 4 °C (Minimum order of 20 packs)
12059	AflaCLEAN™ SELECT, Aflatoxins B1, B2, G1, G2, Pkg 500, 9 month* shelf life at 4 °C (Minimum order of 4 packs)
12062	AflaCLEAN™ SELECT, Aflatoxins B1, B2, G1, G2, Pkg 25, 9 month* shelf life at 4 °C (Minimum order of 20 packs)
12063	AflaCLEAN™ SELECT, Aflatoxins B1, B2, G1, G2, Pkg 500, 9 month* shelf life at 4 °C (Minimum order of 4 packs)

* From date of manufacture

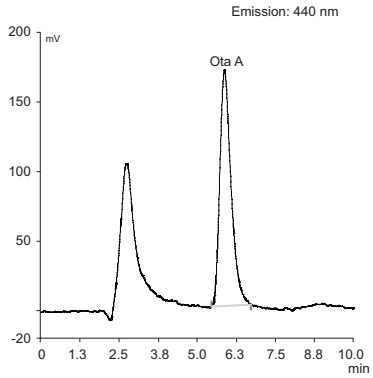
AflaCLEAN™ SMART Cartridges, Special Small Format	
Catalog No.	**Description**
12862	AflaCLEAN™ SMART, Aflatoxins B1, B2, G1, G2, Pkg 100, 9 month* shelf life at 4 °C (Minimum order of 8 packs)
12863	AflaCLEAN™ SMART, Aflatoxins B1, B2, G1, G2, Pkg 1000, 9 month* shelf life at 4 °C (Minimum order of 2 packs)



Distillers grain spiked with 5 ppb total Aflatoxins



Peanut Butter spiked with 5 ppb total Aflatoxins



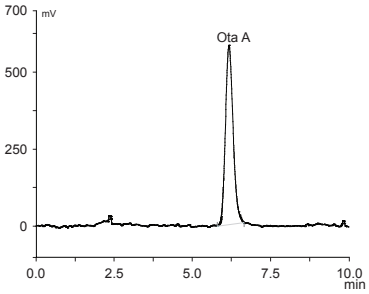
Distillers grain spiked with 5 ppb Ochratoxin A

Clean-Up Columns

Sample Clean-Up Column for Ochratoxin Analysis

OtaCLEAN™ was developed for sample clean-up of foods, grains, feeds, etc. for Ochratoxin A analysis using HPLC or other techniques. The antibody employed possesses a very high Ochratoxin A specificity. This leads to exceptional chromatographic results without any interfering secondary signals and very high recovery rates. Independent of the complexity of the matrix, excellent results can be achieved.

The maximum loading capacity is 200 ng Ochratoxin A. The shelf-life is 2 years (from date of manufacture) at room temperature.



Roasted Coffee spiked with 5 ppb Ochratoxin A

Example Recoveries of Ochratoxin A	
Matrix	**Recovery Rate**
Dried Distillers Grain	102 %
Duran Wheat	92 %
Coffee	100 %
Red Wine	108 %
Rye Bran	91 %
Beer	96 %
Grapes	91 %
Horse Feed	94 %
Wort	107 %

OtaCLEAN™ Sample Clean-Up Columns	
Catalog No.	**Description**
10515	OtaCLEAN™, Ochratoxin A, Pkg 25, 24 month* shelf life at room temp. (Minimum order of 20 packs)
11022	Afla-OtaCLEAN™, Aflatoxins B1, B2, G1, G2 & Ochratoxin A, Pkg 25, 18 month* shelf life at room temp. (Minimum order of 20 packs)
11535	OtaCLEAN™, Ochratoxin A, Pkg 500, 24 month* shelf life at room temp. (Minimum order of 4 packs)
12425	OtaCLEAN™, Ochratoxin A, Pkg 25, 24 month* shelf life at room temp. (Minimum order of 20 packs)
12427	OtaCLEAN™, Ochratoxin A, Pkg 500, 24 month* shelf life at room temp. (Minimum order of 4 packs)

OtaCLEAN™ SMART Sample Clean-Up Columns	
Catalog No.	**Description**
13346	OtaCLEAN™ SMART, Ochratoxin A, special small format, Pkg 100, 9 month shelf life* at 4 °C (Minimum order of 8 packs)
13351	OtaCLEAN™ SMART, Ochratoxin A, special small format, Pkg 1000, 9 month shelf life* at 4 °C (Minimum order of 2 packs)

* From date of manufacture

DONeX

Deoxynivalenol, also known as Vomitoxin, is a metabolite of various molds of the genus Fusarium (*F. culmorum, F. graminearum*) and can often be found on contaminated cereals (wheat, barley, oat).

Generally the toxin is analyzed with HPLC/UV detection or alternatively with HPLC / post column derivatization / fluorescence detection or LC / MS. Whichever method is chosen, a good sample preparation extends life time of the analyzer and of the HPLC column and reduces interferences by matrix components. Moreover the running times of the HPLC system can be reduced for easy matrices from about 25 to 10 minutes by pre-cleaning.

If HPLC/UV detection is used, sensitivity can be dramatically enhanced with larger sample volumes.

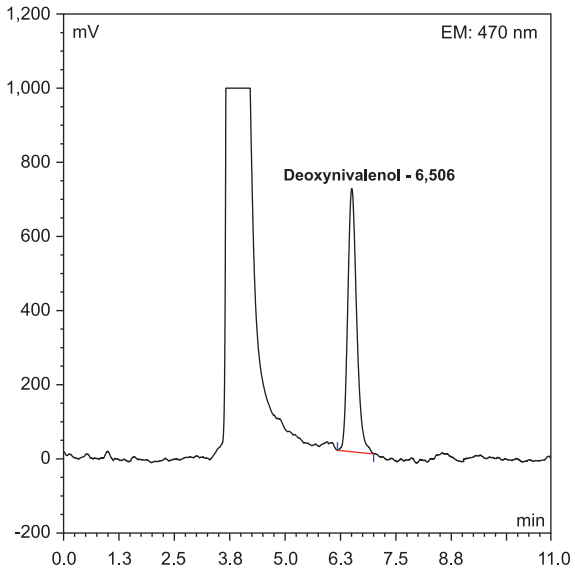
The DONeX column has a matrix load of up to 4 grams. It is ideally suited to many different matrices, including corn, barley, wheat, animal feeds, muesli, and bread.

DONeX™, SPE Clean-Up Cartridge for DON Analysis, 3 mL	
Catalog No.	**Description**
12792	DONeX™, SPE Clean-up Cartridge for DON Analysis, Pkg 25, no expiration at room temp. (Minimum order of 20 packs)
12793	DONeX™, SPE Clean-up Cartridge for DON Analysis, Pkg 500, no expiration at room temp. (Minimum order of 4 packs)

DONeX Column Recoveries	
Matrix	**Recoveries [%] DON**
Bread	108
Corn	90
Chicken Feed	101
Distillers Grain	91
Oat Flakes	100
Pasta (Dried)	105
Poultry Feed	100
Rice	104
Rye	91
Wheat	100
Wheat Bran	99

* All matrices were spiked prior to the extraction. Spiking solution was incubated for at least 1 h with matrix before extraction was started. Calculation of recovery is based on subtraction of values obtained without spiking.

Recoveries for Nivalenol are similar to those observed for Deoxynivalenol.



Chromatogram of a cereal-based poultry feed sample, analyzed with HPLC/post column derivatization/FLD, sample was spiked with 1 ppm DON, extracted and purified, evaporated sample (1 g) was resolved in 2 mL HPLC solvent, 40 µL were injected (0.02 gram matrix equivalents represent 20 ng DON injected)

Clean-Up Columns

Glyphosate and AMPA Sample Clean-Up Cartridges

Pickering SPE sample clean-up cartridges are used to treat samples prior to injection. The strong cation-exchange resin is composed of sulfonic acid functional groups attached to a styrene divinylbenzene copolymer lattice. The high selectivity and ruggedness provides a simple and universal method for removing matrix interference from the sample. The SPE sample clean-up cartridges are ideal for the clean-up of vegetables, fruits and crop samples in the analysis of Glyphosate and AMPA.

Recoveries for Glyphosate and AMPA		
Matrix	**Glyphosate**	**AMPA**
Alfalfa	129 %	116 %
Strawberry	84 %	82 %
Broccoli	97 %	95 %

Sample Preparation

Extraction:

Take 25 g of homogenous sample and add enough water (after estimation of moisture content) to make the total volume of water 125 mL. Blend and Centrifuge.

Matrix Specific Modification:

- High water content – reduce sample amount to 12.5 g
- High protein content – add 100 µL HCl to 20 mL of extract, shake and centrifuge.
- High fat content – perform the methylene chloride partition twice.

Clean-Up

Methylene Chloride Partition:

- To 20 mL of aqueous extract add 15 mL methylene chloride. Shake for 2-3 min and centrifuge.
- To 4.5 mL of aqueous layer add 0.5 mL acidic modifier solution. Shake and centrifuge.

SPE Clean-Up:

- Prepare SPE cartridge (refer to product abstract PA210)
- Transfer 1 mL portions of SPE mobile phase (refer to method abstract MA206 for formulation) and discard the effluent.
- Elute analytes with 12 mL SPE mobile phase

Concentration:

- Evaporate to dryness using rotary evaporator or a vacuum vortex-type evaporator or lyophilize
- Re-dissolve in 2 mL of the SPE mobile phase

Glyphosate Sample Clean-Up Columns	
Catalog No.	**Description**
1705-0001	Glyphosate SPE Sample Clean-up Columns, 50/pkg