Multi-Mycotoxin Analysis

Using the CrossTOX® column for clean samples

Sample Preparation

Cereals are particularly susceptible to mycotoxin contamination due to field and storage fungi. Various mycotoxins can be found in cereals. Thus, an analysis not only for individual but also for all regulated mycotoxins is indispensable.

A fast, efficient but also cost-effective clean-up of the sample prior to analysis by LC-MS/MS helps to reduce costs and to enable a high number of analyses without compromising the analytical instrument.

Advantages at a glance

- High matrix compatibility (can be used for cereals, nuts, dried fruits)
- Excellent recoveries
- Fast sample processing, thanks to a universal extraction protocol
- Reduction of cleaning and maintenance costs (standards and cleaning of analytics)

	Dilute-and-Shoot	CrossTOX Manual processing	CrossTOX Automated processing with FREESTYLE
Extraction	30 - 90 minutes	5-10 minutes	5-10 minutes
Internal standard	For all toxins needed	For less toxins needed	For less toxins needed
Dilution of extract	Necessary	Not necessary	Not necessary
Way of filtration	Syringe filtration	Column filtration	Column filtration
Dispensing	In vial	In vial	Direct injection to LC-MS/MS
Cleanliness of extract	Not clean enough	Very clean	Very clean
LC-MS/MS maintenance	Permanent maintenance	Less maintenance	Less maintenance
Process time / Man power	Heavy workload	Heavy workload	Less workload

Processing Protocol

Mix 20 grams of homogenised matrix with 100 mL of extractant (94 % acetonitrile, 15 % HPLC water, 1 % acetic acid) and extract for a sufficiently long time (about 3-5 minutes). The sample can be clarified by centrifugation (3000 x g, 5 minutes) or filtered to efficiently separate suspended matter. A maximum of 3 mL of the clear extract is passed through the CrossTOX® and collected in a GC vial. Further dilution is not necessary, the sample can be measured directly.

Analytical method: UPLC column Accucore Biphenyl 100 mm x 2.1 mm; 2.6 µm with defender guard; column temperature 38 °C; LC flux A: 98/2 (v/v) water/methanol + 1 % acetic acid + 5 mM ammonium acetate. LC flux B: 98/2 (v/v) methanol/water + 1 % acetic acid + 5 mM ammonium acetate; flow rate 0.4 mL/ min. H-ESI mode.

Time [min]	Eluent A (%)	Eluent B (%)	Curve
0 - 2	95	5	5
2 - 5	15	85	5
5 - 11	5	95	5
11 - 13	95	5	5
13 - 16	95	5	5

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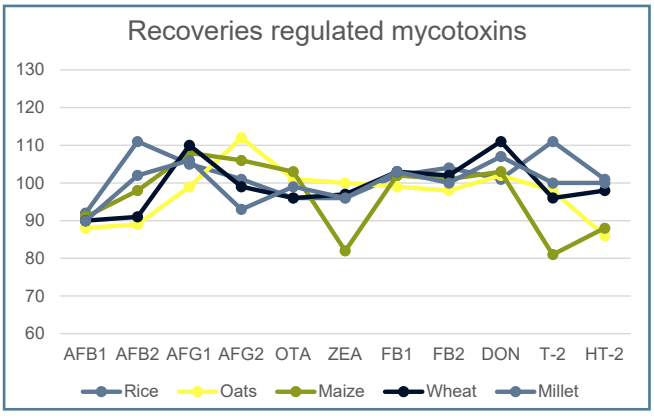
CrossTOX® recoveries from different raw materials

The flexible use of the CrossTOX® column with different matrices with a universal extraction and sample preparation protocol simplifies the work steps and provides reliable, reproducible results. For many analytes, it has been shown that the expensive use of internal standards can be reduced to a minimum.

The costs for internal standards and the influence of non-depleted matrix components on the analysis can be massively reduced by using the non-dispersive CrossTOX® column for sample clean-up in the field of mycotoxin analysis.



Recoveries					
Toxin	Rice	Oats	Maize	Wheat	Millet
AFB1	92	88	91	90	90
AFB2	111	89	98	91	102
AFG1	105	99	108	110	106
AFG2	101	112	106	99	93
OTA	96	101	103	96	99
ZEA	96	100	82	97	96
FB1	102	99	102	103	103
FB2	104	98	101	102	100
DON	101	102	103	111	107
NIV	101	94	100	103	101
3-Ac-DON	99	87	93	93	98
15-AC-DON	99	86	90	92	98
DON-3-GLC	109	91	95	107	89
HT-2	101	86	88	98	100
T-2	111	98	81	96	100
Citrinin	98	98	101	105	94
DAS	107	105	110	115	102
STC	91	86	94	86	94

Conclusion

The use of the CrossTOX® column for sample clean-up not only improves sample quality, but also protects the analysis by purifying and removing interfering substances from the matrix. Best recoveries and reproducible results allow a fast, reliable analysis of cereals but also other matrices.

The CrossTOX® column is a helpful tool to ensure multi-mycotoxin analysis even for heterogeneous sample materials (cereals, dried fruits, nuts). Up to 18 mycotoxins can be quantified reproducibly using LC-MS/MS and the CrossTOX® column.

CrossTOX® Columns

The following *LCTech Product* has been used:

17900 CrossTOX® clean-up column 100 Pcs/Pck

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

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