



# Clean-Up for Deoxynivalenol

## Comparison of *DONeX*<sup>TM</sup> and *CrossTOX*<sup>®</sup>



### Sample Preparation

Next to fumonisin, deoxynivalenol is the most frequent occurring mycotoxin. Deoxynivalenol and derivatives thereof play a major role worldwide, not only in terms of agricultural economics, but also for human and animal health. In particular processed food and feed pose great challenges in analytics due to matrix effects. Both LCTech products compared below, prepare the sample in that way to analyze also the modified version (AcDON, GlcDON) and NIV, not only DON as usually with Immuno-affinity columns.

### Product-Highlights

#### *DONeX*<sup>TM</sup>

For the clean-up of deoxynivalenol and nivalenol from cereals and cereal-containing matrices.

- High toxin loading capacity
- High matrix tolerance (up to 4 grams)
- Efficient matrix depletion enables analysis by ELISA /HPLC-UV or LC-MS/MS with maximum sensitivity from feed to baby food

#### *CrossTOX*<sup>®</sup>

For the comprehensive multimycotoxin analysis of 18 mycotoxins by LC-MS/MS in various matrices (cereals/feed/nuts/dried fruits/spices).

- Fast reconditioning
- Efficient matrix enrichment
- Suitable for 18 mycotoxins in various matrices
- Direct Injection

### SPE columns



### Processing Protocol

Extract 20 grams of homogenised matrix using 100 mL acetonitrile/water/acetic acid (84/15/1). Filter the extracted sample or centrifuge at 3000 x g for 5 minutes, the clarified sample is further used.

Load 20 mL onto the *DONeX* column and collect the flow-through clean-up sample. Rinse the column with 10 mL 84/16 (acetonitrile/water) and combine the rinse solution with the first flow-through sample. 7.5 mL represents 1 gram of matrix equivalent. Condense this using a stream of nitrogen and then redissolve in 1 mL of HPLC water. Filter the obtained sample using a syringe filter, this can now be analysed by HPLC-UV or LC-MS/MS. For analysis by ELISA, the concentrated sample is redissolved in the sample dilution buffer and can then be

applied onto the ELISA as a sample. Due to the efficient depletion of the matrix components, a direct analysis by means of HPLC-UV is possible. In this way, even baby food samples can be properly analysed, as the sample load can be expanded to up to 4 grams. Even in complex and sensitive samples, maximum analytical sensitivity and efficient sample clean-up are guaranteed.

Use the same extraction procedure for the multi-mycotoxin analysis. Pass up to 3 mL of the clarified crude extract through the *CrossTOX* column at a flow rate of 1.5 mL/min. This removes the interfering colour and matrix interferences from the sample and the analytical measurement of the mycotoxins by LC-MS/MS can be performed without further filtration or dilution steps.



The sample contains 0.2 grams of matrix equivalents and can be analysed without interference by LC-MS/MS in positive and negative H-ESI mode. A fast, quantitative and efficient multi mycotoxin analysis is thus ensured.

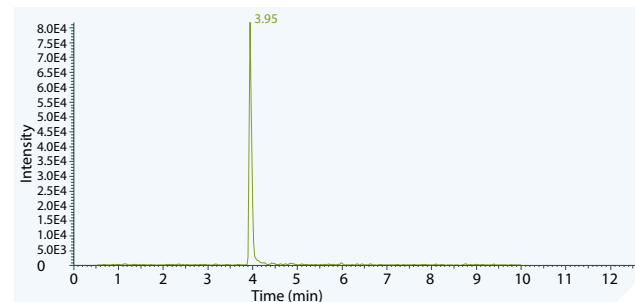
## Results

Deoxynivalenol and nivalenol can be analysed well by isocratic liquid chromatography, a separation of matrix interferences by means of a C-18 RP separation column under isocratic running conditions, gives a good chromatographic separation and separation. For multi-mycotoxin analysis, gradient U-HPLC using a UPLC-biphenyl separation column is necessary, allowing chromatographic separation of the analytes and mass spectrometric determination using H-ESI mode. Due to the efficient analyte and matrix removal e.g. depletion of interferences, the use of internal standards could be massively reduced for many matrices. A comparison between matrix and standard calibration confirmed this. Selective analyte enrichment significantly improves the measurement sensitivity and the chromatographic representation of deoxynivalenol, for a more precise result that is easier to evaluate chromatographically (comparison of LCMS/MS chromatograms).

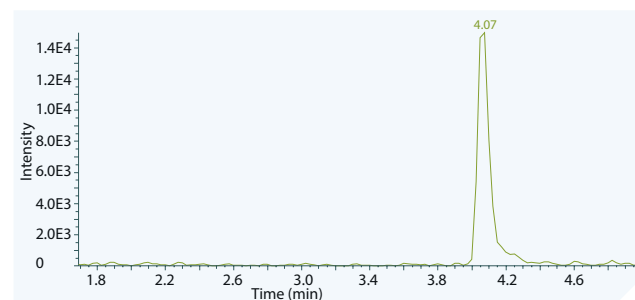
## Conclusion

Efficient reduction of matrix interferences and selective concentration of analytes (DONeX columns) allow fast, efficient and precise analysis of a wide variety of matrices for mycotoxins. The high matrix tolerance (up to 4 gram matrix load) and compatibility for different matrices make these clean-up columns indispensable for mycotoxin analysis. The multi mycotoxin prevalence and occurrence in the same sample demand a multitoxin clean-up which could be achieved by the CrossTOX columns, without discrimination of analytes. Modified DON-toxins can be analysed with both clean-up columns. LCTech supports you in these tasks with a variety of applications and products.

Matrix	Analyte	Clean-up	Recovery (1 ppm) (%)
Wheat flour	DON	CrossTOX	98
Wheat flour	DON	DONeX	97
Wheat flour	FB1/FB2	CrossTOX	98/96
Maize	DON	CrossTOX	99
Maize	DON	DONeX	99
Maize	FB1/FB2	CrossTOX	94/92
Rice	DON	CrossTOX	92
Rice	DON	DONeX	91
Rice	FB1/FB2	CrossTOX	91/93
Gerste	DON	CrossTOX	98
Barley	DON	DONeX	96
Barley	FB1/FB2	CrossTOX	97/92
Oats	DON	CrossTOX	93
Oats	DON	DONeX	91
Oats	FB1/FB2	CrossTOX	94/91
Rye	DON	CrossTOX	98
Rye	DON	DONeX	98
Rye	FB1/FB2	CrossTOX	91/90
Millet	DON	CrossTOX	93
Millet	DON	DONeX	95
Millet	FB1/FB2	CrossTOX	92/94



Deoxynivalenol by LC-MS/MS in H-ESI mode.



Selective enrichment of deoxynivalenol and reduction of matrix interferences allow a reproducible, precise determination of deoxynivalenol in the low ppb range.

### These LCTech products were used:

17900	CrossTOX (100 pcs/Pkg)
12792	DONeX (25 pcs/Pkg)
10522	HPLC column RP C18 150 mm
10523	Guard column
10750	Guard colum holder

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)