

Nos encontramos en la **Conferencia Internacional MicoTWIN - MicoKey** “Acciones clave integradas e innovadoras para la gestión de micotoxinas en la cadena de alimentos y piensos” que se celebra en Bari (Italia).

Hoy por la tarde, Luis Maria Gallego, Director General del Grupo Analiza Calidad, **presentará oralmente** el trabajo **Rapid and sensitive LC-MS/MS analysis of legislated mycotoxins in feed and food samples**. El cual ha sido seleccionado de entre más de 120 trabajos evaluados.

Presentaremos nuestro **sistema de análisis multitoxinas en alimentos y piensos** para cumplimiento del Reglamento (CE) 1881/2006 que hemos desarrollado con nuestra experiencia en análisis de micotoxinas por LC MS/MS, método de dilución isotópica para control multitoxina.

La comunicación y la difusión juegan un papel central en la entrega de las soluciones inteligentes para la seguridad alimentaria. MycoKey actúa como un vehículo para introducir innovación y apoyar las políticas europeas a largo plazo para el crecimiento sostenible y la competitividad en el sector alimentario. Por esa razón, estamos muy orgullosos haber sido seleccionados.

Rapid and sensitive LC-MS/MS analysis of legislated mycotoxins in feed and food samples

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INTRODUCTION

Mycotoxins are toxic secondary metabolites produced by certain filamentous fungi. Different mycotoxins have been identified, but the most commonly observed are aflatoxins, ochratoxin A, trichothecenes and zearalenone. They appear in the food chain in the storage of cereals. Mycotoxins are chemically stable and persist after food processing. The effects of some mycotoxins present in food manifest themselves quickly since changes in the appearance of the product, organoleptic and nutritional properties, causing allergies. Others have been linked to long-term effects, causing fungal and myeloidosis, cancer, and immunodeficiency in both animals and humans. However, climate change will affect the development of cereal crops and the occurrence of mycotoxins in these crops. Several studies has shown increase of deoxynivalenol in wheat¹, aflatoxin B1 in maize² or ochratoxin A in coffee³.

RESULTS

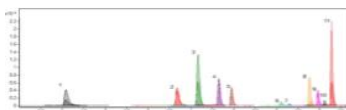


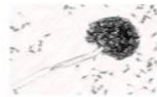
Figure 1. 2 µg/g standard mix solution: deoxynivalenol (1), aflatoxin B1 (2), aflatoxin B2 (3), aflatoxin G1 (4), aflatoxin G2 (5), HT-2 toxin (6), fumonisin B1 (7), T-2 toxin (8), zearalenone (9), ochratoxin A (10) and fumonisin B2 (11).



Figure 2. Recovery of aflatoxins for 11 legislated mycotoxins in cereal, nuts and feed samples.

Table 1. LoQ for 11 legislated mycotoxins.

Mycotoxin	LoQ (µg/kg)
Aflatoxins	1
Ochratoxin A	1
Fumonins	100
HT-2 and T-2 toxins	10
Zearalenone	30
Deoxynivalenol	50



OBJETIVES

1. Develop a method for the simultaneous detection and quantification of 11 mycotoxins in human food and feed samples.
2. Validated this method according to ISO 17025:2017.

METHODOLOGY

Extraction procedure

- Homogeneous sampling
- Weight 2 g of sample into 50 mL centrifuge tube
- Add Zearalenone (ZAN) as surrogate
- Mix 30 min on orbital shaker
- Centrifuge 15 min at 4000 rpm
- Transfer 1 mL to the MycoClean™ 420 column
- Cap column and vortex for 1 minute
- Centrifuge 90 seconds at 10000 rpm
- Mix 80 µL of purified extract with 20 µL ISID
- Inject 2 µL in LC-MS/MS

HPLC conditions

Parameter	Value	Parameter	Value
Column	C18 column, 2.1 x 100 mm, 1.8 µm	Gas temp	300 °C
Flow rate	0.45 mL/min	Gas flow	9 L/min
Column temp	40 °C	Modulator	50 psi
Mobile Phase	A: Water (0.2 % formic acid) + 20 mM ammonium formate	Shield gas temp	375 °C
	B: Methanol (0.2 % formic acid) + 20 mM ammonium formate	Shield gas flow	12 L/min
		Neon voltage	500V(+)/0V(-)
		Capillary	4500V(+)/3000V(-)

CONCLUSIONS

- Simple method for the detection and quantification of mycotoxins.
- Appropriate for the legal limits according to CE Regulations.
- This protocol can be extended for other metabolites and mycotoxins.

REFERENCES

- 1) Van der Fels-Klerx H, J. Oude J, E. Wolden M S, Smit A M (2012) Food Additives & Contaminants Part A: Chemistry, Analysis, Control, Exposure & Risk Assessment 29(10): 1599-1604
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- 3) Adnan A, Moshir A, Nageh A (2005) Impact of increasing climate change factors on growth and aflatoxin A production by Aspergillus niger (Chrwal and Rigi species) on coffee. World Mycotoxin Journal 8(2): 90-97.