

# 1<sup>st</sup> Mycotoxin Analysis Summer School

Supporting sustainable agricultural practices, ecosystem health and exports through accurate measurement.

The European Union imports approximately 140 billion euro's worth of goods from Africa annually. Agriculture is a crucial economic driver across the African continent. Not only due to the value of the export market, approximately 20 000 million euro, but due to the level of job creation in this sector. In addition to its importance economically, agriculture also ensures the continents food security and self-sustainability. One of the factors that can negatively affect both the aspects is food contaminants.

Mycotoxins are a group of food contaminants that consist of secondary fungal metabolites. The toxicity of these compounds is of universal concern as they are present in a host of commodities including grains, grain products, fruits, root vegetables and nuts. Additionally, the presence of mycotoxins in animal feed can also influence livestock and associated food products such as milk.

Mycotoxins are particularly challenging to analyse, due to their presence in such a large variety of matrices. They have varying chemistries, including polarities. Furthermore, the exact mix of mycotoxins that are of relevance to a commodity may be strongly influenced by the environment, farming practices, and storage conditions as well as the seasonal fungal prevalence.

For many countries within the African continent that strongly rely on the agricultural export market, mycotoxins become an issue requiring a multi-disciplinary approach aimed at improving food safety and food security. The aim of this workshop is to empower analysts to analyse mycotoxins in a host of food stuffs, utilising analytical methodologies that fit not only their laboratory infrastructure, but also their specific market needs.

Training will include various sample preparation, extraction, purification, and analytical techniques. We will also discuss the ever-changing regulatory environment and what impact this may have on laboratories.

**Limited space available,  
maximum of twenty  
participants - register now!**

**JOIN OUR MYCOTOXIN  
ANALYSIS JOURNEY**

**From the farm to market  
– how to ensure analysis  
supports industry.**

**21 August - 1 September  
2023**

**An informative workshop  
aimed at anyone interested in  
the analysis of mycotoxins.**



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## Friendly, Knowledgeable Facilitators

- The course will be presented by facilitators that strongly encourage interactive training, with a willingness to share.
- The first day of the course will be combined with a virtual workshop to encourage the sharing of information from suppliers to users throughout the continent.
- Facilitators will include:
  - Desiree Prevoo-Franzsen (NMISA)
  - Deirdre Claasen (NMISA)
  - Dr Caitlin Swiegelaar (NMISA)
- Technical applications featuring the following manufactures/ suppliers
  - Agilent; Phenomenex, Thermo Scientific and Waters
- Presentations by mycotoxin specialists

# WEEK 1 - THEORETICAL CONSIDERATIONS OF MYCOTOXIN ANALYSIS

DAY 1: Mycotoxin workshop	DAY 2: Regulations and Legislation	DAY 3: Extraction and purification	DAY 4: Chromatographic analysis	DAY 5: Method specific workflows
<ul style="list-style-type: none"><li>• Welcome and Remarks</li><li>• Mycotoxin toxicity and risk assessments – the future of legislation</li><li>• New mycotoxins of toxicological interest – what will we need to measure next?</li><li>• The impact of mycotoxins on the African economy</li><li>• Reducing mycotoxin levels – the effect of good agricultural practices?</li><li>• Advances in extraction science – immunoaffinity and new in-field methodologies</li><li>• Sample preparation for mycotoxin analysis – ensuring that your extract is representative</li><li>• The use of test kits in mycotoxin analysis</li><li>• Do new instrumental analysis techniques allow for better results – dilute-and-shoot</li><li>• Latest development in mass spectrometry and other liquid chromatographic techniques for mycotoxin analysis</li></ul>	<ul style="list-style-type: none"><li>• Maximum residue levels, adapting methods to adhere to changing regulation</li></ul>	<ul style="list-style-type: none"><li>• Extraction techniques commonly used for mycotoxin analysis</li></ul>	<ul style="list-style-type: none"><li>• Analytical strength of liquid chromatography and different detectors</li><li>• Quantification approaches</li><li>• Quality control in your mycotoxin laboratory</li></ul>	<ul style="list-style-type: none"><li>• Aflatoxin M1 in milk</li><li>• Aflatoxins in Nuts</li><li>• Ochratoxin in wine</li><li>• Multi-mycotoxins in maize</li></ul>



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Intra-Africa Metrology System  
Système Intra-Africain de Métrologie

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Physikalisch-Technische Bundesanstalt  
Braunschweig und Berlin

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## Measurement and calibration expertise

The NMISA offers calibration and measurements in a wide field of scientific disciplines including, but not limited to:

- Acoustics, Ultrasound and Vibration
- DC Low Frequency and Radio Frequency
- Fibre Optics
- Gas Analysis
- Mass Calibration Services
- Temperature and Humidity Calibration Services
- Photometry and Radiometry
- Essential oils
- Environmental contaminants
- Toxic and nutritional content
- Food contaminants and nutritional content

## WEEK 2 - LET'S GET PRACTICAL SAMPLING TO REPORTING

### DAY 1: Introduction and Dilute and shoot method

- Laboratory safety
- A tour of the NMISA facilities
- Weighing
- Preparing analytical standards
- Preparing samples for dilute-and-shoot method

### DAY 2: Extraction and purification using Size exclusion

- Preparing the laboratory
- Weighing
- Liquid-Liquid extraction
- Size exclusion cleanup
- Preparing samples for injection

### DAY 3: Extraction and purification using Immunoaffinity

- Weighing
- Extraction
- Immunoaffinity SPE
- Preparing samples for injection

### DAY 4: LC-MS/MS and LC-FLD analysis

- Setting up the LC-MS/MS and FLD
- Analytical quality control
- Sample lists
- Data processing
- Troubleshooting based on LC data

### DAY 5: Data processing and reporting

- Calibration curves
- Mass conversions and dilution factors
- Setting up analytical reports
- Q&A session

### We are with you every step of the way

To support your measurement quality control and quality assurance objectives, the NMISA has released several reference materials and certified reference materials. These materials where possible originate from within the African Continent, to ensure compatibility with the samples routinely measured in your laboratory. Reference materials currently available include mycotoxins (analytical standards as well as naturally incurred materials such as maize flour and peanut slurry), forensic blood alcohol analysis analytical standards, matrix materials for nutritional content, nutritional and toxic elements as well as pesticides. Please visit our on-line store for available products and pricing [www.store.nmisa.org](http://www.store.nmisa.org)

- The NMISA provides an extensive suit of products and services to meet your laboratories needs. This includes but is not limited to consultation services that spans the entire lifetime of your laboratory from design to implementation.
- Training in method development; validation and uncertainty.
- Providing calibration, proficiency testing and reference materials to assist your laboratory in meeting quality control and assurance objectives.

### Finding a course that is right for you

The NMISA Training Centre is committed to building measurement capacity in Africa. The centre has a number of courses that may meet your training needs, from personnel at the beginning of their careers to those wanting to develop advanced skills. Please visit our website [www.nmisa.org](http://www.nmisa.org) for more information or contact us at [training@nmisa.org](mailto:training@nmisa.org) or call **+27 12 947 2461**.

### Finding Proficiency Tests that suit your needs

The NMISA is an ISO/IEC 17043 accredited proficiency testing service provider with accreditation in the following fields: Food Testing (chemical additives, residues, and nutritional content); Water Testing (Chemical contaminants and residues) and Forensic Testing (forensic level alcohol, forensic preservatives and breath alcohol).



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