

Tentative Outline

Special/Thematic Issue for the journal "Current Nutrition & Food Science"

Title of the Thematic Issue: New trends in the analysis and mitigation of mycotoxins in cereals.

Guest Editors: Dr. Jesus Simal-Gandara

Co-Guest Editors: Dr. Paz Otero

• Scope of the Thematic Issue:

Cereals are the base of human nutrition. They provide essential nutrients such as carbohydrates, proteins, essential fatty acids, fiber, vitamins B and E and minerals that are considered key elements in the human diet. In this context, it is essential to guarantee the microbiological safety of cereals and their derivatives and to avoid the presence of mycotoxins that can be produced by certain types of filamentous fungi from which *Aspergillus*, *Penicillium* and *Fusarium* are the three main genera. Mycotoxin contamination in cereals can be produced during grain growth, harvest, grain handling and storage so that may generate a health risk due to their genotoxic, hepatotoxic, mutagenic, and carcinogenic effects and may cause a great economic impact because of the product withdrawals in the market. The frequently monitored mycotoxins are ochratoxin A, aflatoxin, patulin, zearalenone, fumonisin, citrinin and groups of trichothecenes and the most frequent method for their detection is liquid-chromatography with mass spectrometry detection. Moreover, new forms of modified mycotoxins have been described in recent years. These compounds are not detectable by the routine analysis methods, nevertheless, they can contribute to the toxicity in food samples. In addition, current research trends are looking for strategies to minimize the risk of mycotoxins, being nanotechnology and carbon-based nanomaterials one useful approach because of its high binding capacity for mycotoxins.

This Special Issue will cover all new approaches focused on the search of mycotoxins in cereals with a special focused on modified ones, including the development of rapid tests for their screening, the *in vivo* and *in vitro* assays to test their toxicity and the optimization of analytical techniques constituting a new challenge in the detection of these toxic metabolites for consumers' protection. It is important to invest in the implementation of modified mycotoxin analysis on a routine basis, which can contribute to risk assessment and the identification of tolerable limits of these compounds as well as to continue dedicating efforts in the development of techniques intended for food analysis and mycotoxin reduction methods from the crops to the cereal processing.

Keywords: advanced quantitative techniques; liquid chromatography-mass spectrometry; gas chromatography; nanoparticles; nanotechnology; modified mycotoxins; toxicity; risks assessment.

Sub-topics:

- Development of new hyphenated analytical methods for the identification of mycotoxins
- Development of rapid test for the detection of mycotoxins in cereals
- Strategies to minimize the risk of mycotoxins based on nanotechnology
- *In vivo* and *in vitro* assays to test mycotoxins toxicity

Schedule:

- ✧ Thematic issue submission deadline: **31st of December 2023**

Contacts:

Guest Editor Name: Dr. Jesus Simal-Gandara

Affiliation: University of Vigo, Nutrition and Bromatology Group, Analytical Chemistry and Food Science Department, Spain

Email: jsimal@uvigo.es

Co-Guest Editor Name: Paz Otero

Affiliation: University of Vigo, Nutrition and Bromatology Group, Analytical Chemistry and Food Science
Department, Spain

Email: paz.otero@uvigo.es