



CIHEAM

International Centre for Advanced
Mediterranean Agronomic Studies
Mediterranean Agronomic Institute of Zaragoza



Centre de Recerca en Agrotecnologia - Universitat de Lleida

Advanced Course

MYCOTOXINS IN CEREAL FOOD/FEED CHAINS: PREVENTION AND CONTROL STRATEGIES TO MINIMIZE CONTAMINATION

Zaragoza (Spain), 12-16 May 2014

1. Objective of the course

Cereals are a major component of human and livestock diets worldwide and mycotoxins are major natural contaminants in cereal food/feed chains. The consumption of mycotoxin-contaminated commodities is related to several acute and chronic diseases in humans and animals and thus has significant economic and social impacts. Many countries, including the EU, have strict legislative limits in place to minimize consumer exposure to these mycotoxins in food. Thus, mycotoxin contamination has an impact in both developing and developed countries and can affect the availability of staple cereals as well as influence the nutritional quality for human and animal consumption. Food insecurity may also increase in coming years due to climate change and therefore result in more significant mycotoxin related outbreaks in cereals.

This is a very timely course with a food chain approach integrating knowledge from different disciplines. It will contribute to the improvement of mycotoxin risk management and will be beneficial to key stakeholders in the cereal food and feed chains.

The objective of the course is to deliver both theoretical and practical knowledge in key cereal food chain stages to minimize mycotoxin contamination. By the end of the course participants will have gained:

- Better knowledge on the HACCP and CCPs for the important mycotoxins in cereal chains.
- A better perspective on the legislative framework in the European Union and worldwide.
- Awareness of the importance of understanding life cycles of key mycotoxigenic fungi and mycotoxin dynamics for better prevention and control in food/feed chains.
- Improved understanding of risk prediction, decision making and intervention practices in cereal chains from pre-harvest to processing of final products.
- Experience in the development of mycotoxin prevention strategies using integrated case studies.
- Practical skills on the analysis of toxigenic fungi and mycotoxins.
- Outlook on future developments in the context of the food security agenda.

2. Organization

The course is jointly organized by the International Centre for Advanced Mediterranean Agronomic Studies (CIHEAM), through the Mediterranean Agronomic Institute of Zaragoza (IAMZ), and Agrotecnio Center of the University of Lleida, and will take place at the Mediterranean Agronomic Institute of Zaragoza. The course will be given by well qualified lecturers from international institutions and from research centres and universities in different countries.

The course will be held over a period of 1 week, from 12 to 16 May 2014, in morning and afternoon sessions.

3. Admission

The course is designed for a maximum of 25 participants with a university degree and is aimed at professionals from public administrations and the food/feed industry, such as members of the competent authorities for inspection, cereal producers, business operators, risk managers and quality managers. The course is also open to technical advisors and professionals from R&D institutions dealing with crop production and protection, food/feed safety, and risk analysis.

Given the diverse nationalities of the lecturers, knowledge of English and French will be valued in the selection of candidates, since together with Spanish, they will be the working languages of the course. However, if necessary, the Organization will provide simultaneous interpretation of the lectures.

4. Registration

Application forms may be obtained from:

Instituto Agronómico Mediterráneo de Zaragoza
Avenida de Montañana 1005, 50059 Zaragoza (Spain)
Tel.: +34 976 716000 - Fax: +34 976 716001
e-mail: iamz@iamz.ciheam.org
Web: www.iamz.ciheam.org

Candidates should send the completed application form to the above address, accompanied by a detailed *curriculum vitae*, stating degree, diplomas, experience, professional activities, language knowledge and reasons for applying to the course. Copies of certificates should be enclosed with the application.

Please display on a notice board if possible



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See updated information at

www.iamz.ciheam.org

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The deadline for the submission of applications is **26 February 2014**.

Applications from those candidates who cannot present their complete records when applying, or those requiring authorization to attend the course, may be accepted provisionally.

Registration fees for the course amount to 450 euro. This sum covers tuition fees only.

5. Scholarships

Candidates from CIHEAM member countries (Albania, Algeria, Egypt, France, Greece, Italy, Lebanon, Malta, Morocco, Portugal, Spain, Tunisia and Turkey) may apply for scholarships covering registration fees, and for scholarships covering the cost of travel and full board accommodation in the Hall of Residence on the Aula Dei Campus.

Candidates from other countries who require financial support should apply directly to other national or international institutions.

6. Insurance

It is compulsory for participants to have medical insurance valid for Spain. Proof of insurance cover must be given at the beginning of the course. Those who so wish may participate in a collective insurance policy taken out by the IAMZ, upon payment of the stipulated sum.

7. Teaching organization

The course requires personal work and interaction among participants and with lecturers. The international characteristics of the course favour the exchange of experiences and points of view.

The programme includes applied examples, case studies, and demonstrations and hands-on laboratory practicals on diagnostic tools.

Furthermore, during the course, participants will work in groups on practical exercises with the objective of applying the different components of risk analysis or the HACCP principles based on case studies. This exercise will enable them to put theory into practice and gain experience in applying a structured framework to identify and manage mycotoxin risks, or to control mycotoxin safety hazards in cereal chains.

8. Programme

1. General background (1 hour)

- 1.1. Cereal food chain
- 1.2. Mycotoxigenic fungi and mycotoxins
- 1.3. Toxicology and risk analysis in the legal framework

2. Ecophysiology of key mycotoxigenic species (2 hours)

- 2.1. Environmental conditions
- 2.2. Growth and mycotoxin production

2.3. HACCP and CCPs for minimizing mycotoxin risks

3. Life cycle of toxigenic fungi in cereal cropping systems (2 hours)

- 3.1. Maize
- 3.2. Small grains
- 3.3. Case study: St Anthony's fire, can we learn from history?

4. Pre-harvest challenges and problems (5 hours)

- 4.1. Sustainable intervention actions for minimizing fumonisins and aflatoxins in maize
 - 4.1.1. Good agricultural practices
 - 4.1.2. GMO and less susceptible maize hybrids
 - 4.1.3. Integrated control
- 4.2. Mitigation strategies for controlling trichothecenes, zearalenone and ergot alkaloids in small grains
 - 4.2.1. Good agricultural practices
 - 4.2.2. Integrated control
- 4.3. Prospects of biological control solutions
- 4.4. Georeference modelling as a risk management tool in a climate change framework

5. Post-harvest conservation systems for food and feed (4 hours)

- 5.1. Drying and safe storage technologies
- 5.2. Physical strategies to prevent mycotoxins in medium and long term storage
- 5.3. Chemical approaches in feed chains
- 5.4. Mycotoxins adsorbents
- 5.5. Future prospects for safe storage (modelling, real time monitoring, biocontrol)

6. Mycotoxin dynamics and partitioning during processing (2 hours)

- 6.1. Non-thermal processing
 - 6.1.1. Sorting and cleaning
 - 6.1.2. Milling
 - 6.1.3. Brewing
- 6.2. Thermal processing
 - 6.2.1. Baking
 - 6.2.2. Extrusion

7. Integrated cereal chain solutions (4 hours)

- 7.1. Developing practical HACCP plans for mycotoxins
- 7.2. Legislation differences in the European Union and worldwide
- 7.3. Representative sampling
- 7.4. Diagnostic tools for monitoring the CCPs and mycotoxins

8. Group work based on case studies (9 hours)

- 8.1. Work presentation
- 8.2. Working sessions
- 8.3. Presentation of results and debate

9. Laboratory practicals and demonstrations (6 hours)

- 9.1. Mycotoxigenic fungi of cereals
 - 9.1.1. Quantification techniques
 - 9.1.2. Isolation and identification by classical and molecular techniques
- 9.2. Mycotoxin analysis in relation to legislative limits
 - 9.2.1. Lateral flow devices and ELISA methods
 - 9.2.2. HPLC methods

GUEST LECTURERS

P. BATTILANI, Univ. Cattolica del Sacro Cuore, Piacenza (Italy)

A. CRESPO, Agrotecnio Center, Univ. Lleida (Spain)

J. KÖHL, Wageningen UR (The Netherlands)

N. MAGAN, Univ. Cranfield (UK)

S. MARÍN, Agrotecnio Center, Univ. Lleida (Spain)

A.J. RAMOS, Agrotecnio Center, Univ. Lleida (Spain)

V. SANCHIS, Agrotecnio Center, Univ. Lleida (Spain)

F. VERSTRAETE, European Commission, DG Health and Consumers, Brussels (Belgium)
