



Newsletter of CRL Mycotoxins

Issue 1/2009

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Operating Manager: Joerg Stroka



The mission of the IRMM is to promote a common and reliable European measurement system in support of EU policies.

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Operating manager foreword

Dear colleagues from the CRL/NRL network for mycotoxins

It is a pleasure to welcome you to this first issue of the CRL/NRL newsletter for our network, where I look forward to our future collaboration.

Mycotoxins are still a matter of international concern in several ways as we can see from all related scientific and legislative activities around it. One of the main pillars in dealing with mycotoxins is indeed the reliable and efficient monitoring of food and feed at all stages of the production.

A reliable and efficient monitoring, on the other hand, is a function of several factors, such as the practicability and suitability of analytical methods used at all stages, the proper implementation of these analytical methods for all parties carrying out an analysis and - last but not least - the costs associated with it. Therefore a high degree of competence in the respective laboratories is of key importance for the mutual acceptance of analytical results, which is reflected by the IRMM motto "Confidence in measurements".

To implement this vision, the CRL/NRL network plays a crucial role in providing the basis for reliable results in the field of mycotoxin determination throughout the Single Market of Europe.

One of the steps within the network is the dissemination of facts and results relevant to this network that help us to reach a consensus in our decisions. This newsletter is intended to be one of these tools, along with the annual CRL/NRL workshop, the common proficiency tests as feedback tools, bilateral training options to help us help ourselves and the exchange of opinions.

The first issue of this newsletter therefore contains rather general topics that can be used as a "database", but also specific topics from NRLs to better understand each others specific position within the European Union.

I want to thank at this point all that have contributed to this first issue and hope that other readers will contribute themselves in future issues. In addition, a Technical Report "Mycotoxins factsheet" with general information about mycotoxins, from chemical structure to analytical methods and many other technical items is in the making.

You can send your comments and suggestions on this newsletter to the following mail box:

jrc-irmm-crl-mycotox@ec.europa.eu

With kindest regards,

Joerg Stroka
CRL Mycotoxins Operating Manager

Table of contents

Operating manager foreword.....	1
Main feature of the issue	3
The CRL/NRLs Mycotoxins network	5
Important dates	5
News from the NRLs	5
Questions to the CRL-NRL Network	5
Activities at JRC-IRMM	5
National Reference Laboratories (NRLs) contribution "Organisation of food control in different European countries".....	6
Official control of food in Italy	6
Monitoring of mycotoxins in feed in the Netherlands	7
Upcoming International Events	9
Upcoming Training Activities	10
Acknowledgements	10

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Main feature of this issue

This first issue of the CRL Mycotoxins Newsletter highlights the EU legislation approach to food safety relevant for contamination from mycotoxins.

[Regulation \(EC\) No 178/2002 of the European Parliament and of the Council](#) constitutes the foundation of the legislation frame for food control, "laying down the general principles and requirements of food law, establishing the European Food Safety Authority and laying down procedures in matters of food safety".

Its main points are consequent to the Commission guiding principles for the European food safety policy settled into the [White paper on Food Safety - COM \(1999\)](#). The application of an integrated approach to guarantee food quality through a controlled chain "from farm to fork" is the important novelty of this document. Its proposals cover all sectors, including feed production, primary production, food processing, storage, transport and retail sale.

The functions and duties of the CRLs and NRLs, as defined in [Regulation \(EC\) No 882/2004 of the European Parliament and the Council](#), fall within that general frame. The network CRLs-NRLs-Official control laboratories facilitates an area where food safety is optimised, through the common effort of ensuring homogeneous and acceptable level of food and feed controls across all the Member States of the European Union. All necessary controls on commodities from third countries and in third countries are regulated.

Regulation (EC) 882/2004 also takes into consideration animal welfare.

In particular, the legislation concerning mycotoxins in food covers both the definition of maximum levels ([Commission Regulation \(EC\) No 1881/2006](#) - Text with European Economic Area - EEA relevance) for various foodstuffs, [Commission Regulation \(EC\) No 1126/2007](#), amending Commission Regulation (EC) No 1881/2006 for Fusarium toxins) and the requirements for the methods of sampling and analysis to be used for the determination of mycotoxins levels in foodstuff: [Commission regulation \(EC\) No 401/2006](#).

In the Commission Regulation (EC) No 1881/2006 the maximum levels for various mycotoxins in the Annex, Section 2. The maximum levels range from 0.10 µg/Kg, for aflatoxin B₁ in food intended for infants, to 2000 µg/Kg, for Fusarium toxins in unprocessed maize. All technical references to the choice of the limited mycotoxins and foodstuffs concerned are reported and discussed in the points (21) to (38) of the introduction part of this Regulation.

In case of Fusarium toxins contamination, the maximum levels laid down in Regulation (EC) No 1126/2007 are the actual reference; they range from 20 µg/kg, for Zearalenone in food intended for infant consumption, to 4000 µg/Kg for the sum of Fumonisin B1 and B2 in unprocessed maize).

The harmonisation of food controls in the European Union could be achieved through, besides the definition of the maximum levels and of the concerned mycotoxins, the harmonisation of the quality parameters required for methods of analysis.

We would like to focus here on the provisions laid down for methods of analysis.

No reference to a standard method is included in the mentioned legislation, but specifications for performance parameters which should characterise the method in use are set.

In the Commission Regulation (EC) No 401/2006, Annex II general requirements, specific requirements (performance criteria and fitness-for-purpose approach) are laid down.

The general requirements are described at point 4.2: methods of analysis used for food control purposes shall comply with the provisions of points 1 (list of parameters the analytical methods should be characterised for) and 2 (requirements for precision) of Annex III to Regulation (EC) No 882/2004.

Specific requirements are reported at point 4.3. The regulated performance criteria are: precision (HORRAT Values for repeatability and reproducibility) and recovery; these criteria vary for different concentration ranges. In the case of aflatoxins, also the negligibility of the blank is required. The 'Fitness-for-purpose' approach foresees a maximum standard measurement uncertainty calculated from the LOD of the method and the concentration of relevant(s) mycotoxin(s) in the sample.

No statement is present concerning the expression of results onto the report (units and with the same number of significant figures). The correction of the result for recovery is optional but in the report it shall be mentioned whether the result is correct for recovery or not. Uncertainty boundaries shall accompany all the reported analytical results; expanded measurement uncertainty, using a coverage factor of 2, which gives a level of confidence of approximately 95 %, is used.

Worldwide regulations for mycotoxins in food and feed is reported and discussed in the FAO Food and Nutrition Paper 80 (2003): [FAO link to the PDF document](#)

A complete description of the legislative process, of the involved bodies and institutions and of the active food legislation in Europe is reported in:

[European Food Law Handbook, B. v.d. Meulen and M v.d. Velde. 2008: Wageningen Academic Publishers, The Netherlands. Editors](#)

In the Technical Note "Mycotoxins Factsheet" on the CRL webpage, links to the active legislation for mycotoxins in food are reported.

The CRL/NRLs Mycotoxins network

Important dates

The reporting of results in the Proficiency Test 2008 organised for the NRLs and concerning the determination of Deoxynivalenol (DON) in cereal products and solvent, closed in September. The report will be issued within December 2008.

The Interlaboratory Method Validation for Ochratoxin A in feed method validation was open also to other laboratories than NRLs. A first statistical elaboration of the results reported was delivered to the participants and a complete report will follow soon.

The 2009 workshop of the CRL Mycotoxins/NRLs network will take place at the JRC-IRMM in Geel (Belgium) in 26-27 March.

News from the NRLs

From the next issue of the newsletter, this section will be dedicated to briefs from the NRLs concerning general information (change of address or denomination of the NRL) or technical information (new analytical activities, new foodstuffs of interest, analytical techniques tested, etc).

Questions to the CRL-NRL Network

Questions from the NRLs and other control laboratories of general interest will be collected, published as interesting issues and answers provided: **please, participate!**

Activities at JRC-IRMM

The CRL Mycotoxins was established at the JRC Institute for Reference Materials and Measurements (IRMM) in 2006.

IRMM is one of the seven institutes of the Joint Research Centre (JRC), a Directorate-General of the European Commission (EC). The main fields of its activity are: production of reference materials, expert advisory in food safety and quality and bio-analysis as well as providing of reference measurement data. For more detailed information, please visit the IRMM web-page.

<http://irmm.jrc.ec.europa.eu/>

National Reference Laboratories (NRLs) contribution "Organisation of food control in different European countries"

NRLs are requested for a contribution on the above mentioned subject. The first issues of the newsletter will feature the description of the food control organisation in the different Member States of the European Union. In this issue, food and feed control structure is presented for Italy and the Netherlands.

Official control of food in Italy

Author: Carlo Brera, Centro nazionale per la qualità e per i rischi alimentari (CNQRA) - Istituto Superiore di Sanità (ISS), NRL for Italy

In Italy, food safety issue falls mainly under the responsibility of the Ministry of Health (MH) through the implementation of the official control activities aimed at guaranteeing the safety of food products. The net of the institutions belonging to the National Service of Public Health (SSN) covers all the territory and is composed of central and border offices. In addition, in the regions and provinces under special statutes conferring local autonomy, the same activities are performed by a territorial jurisdiction.

The official control activities regard both food products of national origin intended for the internal market and for their commercialization in the Member States or Third Countries and imported commodities to be commercialized within the national market.

Control activities are implemented in all stages of the total food chain from the production to the distribution to the final consumer. The main activities of the official control include: inspection, drawing of samples and their laboratory analyses for testing the sanitary status of raw agricultural commodities, ingredients, processing aids, and any other product used to food preparations, documentary check, control of the hygienic requisites of all the personnel involved in control activities, and check of audit actions undertaken by companies and stakeholders including the evaluation of technological cycles in processing and production of food products, storage procedures and labelling issues.

The Ministry of Health is the Central Competent Authority. The Department of Veterinary Public Health Nutrition and Food Safety (DVPHNFS) - Office VIII of the Directorate General for Food Safety and Nutrition (DGFSN) of MH is responsible for national policy issues, planning, co-ordination, monitoring, supervision of official control activities and of collating information from the Regions relating to the national programmes for the official control of foodstuffs (and for pesticides residues). It also acts as focal point for the coordination and planning of multi-annual plans both for food and feeds.

Office VIII also co-ordinates the accreditation process for laboratories involved in official controls. At regional level the coordination of the cited activities falls under Regional Public Health Services (Assessorati Regionali alla Sanità). They have responsibility for the official control of foodstuffs. Official controls on production, commercialization and distribution of food products are carried out at local level by the services (the Food Hygiene and Nutrition Service, SIAN, and the Local Veterinary Services, LVS) of the Local Health Units (AUSL). The analyses related to the control activities are performed by the laboratories of public territorial institutions. Laboratory services for animal health, food and feed are provided by a network of public laboratories at regional level. Analyses of food of animal origin and animal health are carried out by the Experimental Zooprophyllaxis Institutes (IZS). There are 10 IZS, with 90 field diagnostic units at provincial level. The IZS are subject to control and supervision by the Regions and co-ordination by the DVPHNFS. Analysis of contaminants, pesticides and foodstuffs of plant origin is carried out by 105 Agencies for Environment Protection (ARPA). The ARPA comprise both laboratories responsible for environmental monitoring and laboratories responsible for food controls, formerly known as Multi-Territorial Prevention Offices (PMP). The ARPA report to the local AUSL but they may perform analyses for more than one AUSL in a particular a region. At national level, the National Health Institute (ISS) is the leading technical and scientific

public body of the SSN. The ISS (which is under the remit of MH) supervises the laboratories of the Italian National Health Service engaged in food and feed control and performs confirmatory analysis. As for animals or products of animal origin from another EU Country non-discriminatory random checks are performed by the newly created 17 Veterinary Offices for Community Obligations (UVACs), working under the Ministry of Health. Unlike products of Community origin, lots of animals and products of animal origin imported from non-EU Countries must undergo systematic checks before being admitted onto Italian territory. These checks also come under State jurisdiction and are attributed to the MH, being carried out at 37 Border Inspection Posts (BIPs). Controls pertaining to the safety of vegetable products imported from non-EU Countries come under State jurisdiction and are attributed to the Ministry of Health. These controls, carried out by the 12 Maritime frontier health Offices (USMAF), are performed on all shipments of vegetable products destined for human consumption. These Offices also carry out controls on additives, aromas, processing aids and materials likely to come into contact with food. As far as RASFF actions, the General Directorate of the MH (Office VIII) is responsible for the operations of RASFF. It issues instructions and recommendations to the BIPs and to the Regions in order to improve the efficiency of the RASFF and monitors its operation. Risk assessment is carried out on a case-by-case basis in consultation with the sectional offices of the DVPHNFS and/or the ISS. In case of risk for public health, the withdrawal of the product over the all territory is promptly performed by the action undertaken from Local Health Units and Carabinieri Health Protection Unit (NAS). The NAS take part in the control activities as part of their competence for monitoring hygiene measures and carrying out health inspections in a wide range of areas, including water, beverages, meat, processed food, dairy products, catering, etc. They may be requested to perform control activities in support of MH or in cases of multiregional or national significance requiring co-ordinated action. In addition to the MH, other official control activities are performed by the Ministry of Agriculture through the Central Inspectorate for Fraud Repression (Ispettorato Centrale Repressioni Frodi – ICRF) dealing with prevention and repression of food adulteration. The ICRF is an inspection body of the Ministry for Agricultural and Forestry Policy (MPAF) that participates in the controls of the feed ban. Analyses are carried out by the ICQ laboratories.

Monitoring of mycotoxins in feed in the Netherlands

Author: Hans Mol, RIKILT Institute of Food Safety (FEED), NRL for the Netherlands

In the Netherlands, feed materials have been monitored for mycotoxins since the 1980s. In the early years, the focus was on aflatoxin B1 in cattle feed which can result in the occurrence of aflatoxin M1 in milk. In later years, following reports that other mycotoxins could have a negative impact on animal health and growth, the scope was extended. A coordinated national program for control of mycotoxins (and other undesirable substances) in feed was established in 2000. This program is on-going to gain insight in the occurrence of mycotoxins in feed, take legal action if applicable, and to fulfil the requirements set in EU regulation 882/2004.

The analysis of feed materials for the official control is performed by RIKILT-Institute of Food Safety (Wageningen) which is also the National Reference Laboratory for mycotoxins in feed. Until 2004, mycotoxins were determined using single-analyte methods based on immunoaffinity clean up and HPLC with UV or fluorescence detection. These methods were largely replaced by one method based on LC-MS/MS which allowed simultaneous determination of aflatoxins, ochratoxin-A, deoxynivalenol, fumonisins, T2- and HT-2 toxin and zearalenone. More recently, a further extension of the scope with other mycotoxins and also plant toxins has been made in order to obtain information on occurrence of 'emerging' natural toxins that have not be regulated so far.

The national control program (National Plan Feed) is established by the Food and Consumer Product Safety Authority (VWA). The program is yearly updated based on findings, new legislation and recommendations (such as 2006/576/EC), and product flows. Besides official control, the agribusiness also generates analysis data which are collected by the Product Board Animal Feed (PDV). Data from both sources are compiled in a national database (Quality program Agricultural

Products, KAP) managed by RIKILT. This database is an important source for risk assessment and trend analysis. In 2006, a trend analysis was performed for aflatoxin B1 in feed with the aim to enable VWA to develop a more risk-directed sampling strategy. As far as aflatoxin B1 was concerned, the trend analysis would justify a reduction in the number of samples for certain feeding materials. However, for other mycotoxins, e.g. deoxynivalenol and zearalenone, the amount of data was (still) limited and trends could not, or not yet, be observed. Consequently, the monitoring program has been continued with multiple-mycotoxins for all feed materials, with special attention to silage (influenced by climate) and complete feedingstuffs for pigs (animal welfare). An overview of the current monitoring program is presented in Table 1.

Table 1. National Plan Feed, mycotoxins, Netherlands, 2008

Commodity	Sampling location	Total # samples
Feed materials (outside EU) (by-products of ground nuts, palm kernel, maize, copra, cotton, citrus pulp)	Sea harbors	100
Feed materials (EU) (emphasis on by-products of rapeseed, and maize)	Feed Producers	50
Silage	Cattle farms	100
Complementary and complete feedingstuffs for dairy cattle	Feed Producers	100
Complementary and complete feedingstuffs for pigs	Feed Producers	50

Upcoming International Events

"CIES International Food Safety Conference"

4 to 6 February 2009 –Barcelona (Spain)

[CIES Conference](#)

"237th ACS National Meeting"

22 to 26 March 2009 - Salt Lake City, Utah (USA)

[ACS-AGFD Meeting](#)

"Cereals & Europe Spring Meeting 2009"

25 to 27 March 2009 - Newcastle upon Tyne (UK)

[C&E 2009 Meeting](#)

"Second SAFE consortium International Congress on Food Safety: Novel Technologies and Food Quality, Safety and Health"

27 to 29 April 2009 – Girona (Spain)

[SAFE International Congress 2009](#)

"14th International Congress of Metrology: Added value through better measurement"

22 to 25 June 2009 – Paris (France)

[Metrology 2009](#)

"Worldwide Mycotoxin Reduction in Food and Feed Chains"

9 to 11 September 2009 - Tulln/Vienna (Austria)

[ISM 2009](#)

"AACC International Annual Meeting"

13 to 16 September 2009 - Baltimore, MD (USA)

[AACC 2009 Meeting](#)

"123rd Annual Meeting & Exposition"

13 to 16 September 2009 - Philadelphia Marriott Philadelphia – PA (USA)

[AOAC Annual meeting](#)

"46th Congress of the European Societies of Toxicology"

13 to 17 September 2009 – Dresden (Germany)

[Eurotox 2009](#)

"ILAC/IAF Conference"

9 to 21 October 2009 – Vancouver (Canada)

[ILAC / IAF 2009](#)

"4th International Symposium on Recent Advances in Food Analysis (RAFA 2009)."

4 to 6 November 2009 – Prague (Czech Republic)

[Food Analysis Symposium](#)

"VI Latinamerican Congress of Mycotoxins" and "II International Symposium on Fungal and Algal Toxins in Industry"
30 November to 4 December 2009 – Merida / Yucatan (Mexico)
[Phyco and Mycotoxins](#)

Upcoming Training Activities

"Fusarium toxins in food - Training course"
28 to 31 October 2008 - Central Science Laboratory, York (UK)
[CSL training](#)

6 to 7 May 2009 - Geel (BE)
Use of reference material and the estimation of measurement uncertainty.
This course provides participants with the theoretical basis for the estimation of measurement uncertainty and establishment of traceability. The course is intended for laboratory managers and practitioners in analytical laboratories who use reference materials for statistical quality control, method validation and calibration and need to assess measurement uncertainties on customer's demand or as requirement of ISO 17025.
[Course leaflet](#)

Acknowledgements

For the compilation of this newsletter, the contributions of the NRLs of Italy and The Netherlands for the description of the Food Control Organisation in their countries are acknowledged.

Abstract

The Regulation 882/2004 reports at the point (18) of the introduction the following sentence: "The designation of Community and national reference laboratories should contribute to a high quality and uniformity of analytical results. This objective can be achieved by activities such as the application of validated analytical methods, ensuring that reference materials are available, the organisation of comparative testing and the training of staff from laboratories."

The CRL Mycotoxins newsletter aims to help achieving this uniformly high level of competence in food control through an improved sharing of scientific information, implementing a mean of communication between the CRL and the NRLs and towards all the interested professionals (the newsletter will be published onto the CRL webpage) and encouraging collaboration from NRLs with contributions since the first issue of the newsletter.

The mission of the JRC is to provide customer-driven scientific and technical support for the conception, development, implementation and monitoring of EU policies. As a service of the European Commission, the JRC functions as a reference centre of science and technology for the Union. Close to the policy-making process, it serves the common interest of the Member States, while being independent of special interests, whether private or national.

