



GMOs and other European Reference Laboratories in food and agriculture

Elke Anklam

JRC-Institute for Health and Consumer Protection (IHCP)

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



The consumer expects that food

- is fresh, however able to be stored
- looks and tastes good
- is as natural as possible
- is wholesome
- is not expensive
- is safe

The Consumer

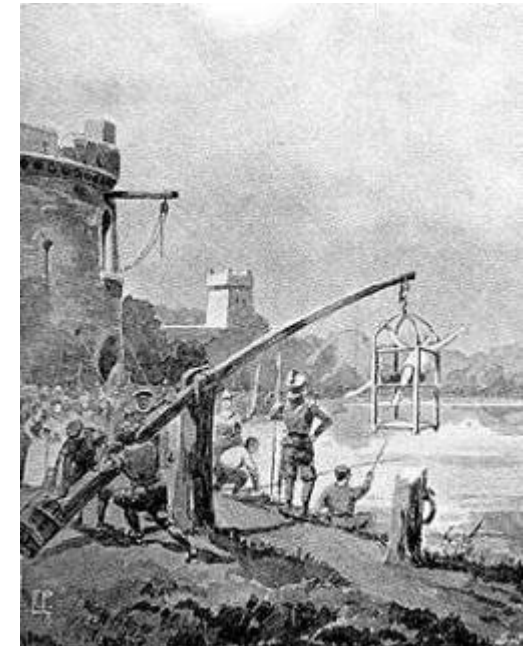
- **Gets a huge amount of information (label, media, expert advice);**
- **Has problems by understanding different opinions, sometimes contradictory due to many information sources;**
- **Has confidence in official food control and in food industry?**
- **Is there a typical consumer?**



Food manipulation is as old as trade

- **Addition of water to wine, milk and ...**
- **Addition of ground leafs and sand to spices**
- **Addition of chicory to coffee**
- **Addition of ground soil to cocoa powder**
- **Addition of sawmill waste or mashed potato to bread**

Some adulterations had food safety and health implications (e.g. lead acetate in wine, PolyChlorinated Biphenyls (PCBs) in edible oils, dioxins in animal feed...)



Punishment of bakers for malpractice in Vienna



European Legislation to Protect the Consumer

Safety Aspects

- protect the health of the consumer;
- ensure the implementation of maximum limits.

Quality Aspects

- ensure correct labelling;
- detection and prevention of frauds.



Regulation (EC) Nr. 882/2004

Food Control needs to be harmonised and results need to be of consistently high quality

For official control, laboratories need to use internationally recognised standard methods for analysis

Laboratories need to comply with quality criteria, e.g. accreditation according to ISO 17025

Whenever possible, methods should be internationally standardised



Regulation (EC) Nr. 776/2006 lists the establishment of Community (CRLs) and National Reference Laboratories (NRLs)

27 Institutions taking care of 21 areas on food and feed control;

13 Institutions taking care of 13 areas on animal health.



Community (CRLs) and National Reference Laboratories (NRLs)

Support to high quality and harmonisation of analytical results by provision of:

- **reference methods**
- **reference materials**
- **proficiency testing schemes**
- **training of laboratory staff**



The CRLs within the JRC

- ★ Genetically modified organisms – IHCP, Ispra, IT
- ★ Feed additives – IRMM, Geel, BE
- ★ Food contact materials– IHCP, Ispra, IT
- ★ Heavy metals (Trace elements)– IRMM, Geel, BE
- ★ Mycotoxins – IRMM, Geel, BE
- ★ Polycyclic aromatic hydrocarbons – IRMM, Geel, BE



Research-based policy support in the GMO area is a pan-JRC activity

Institute for Health and Consumer Protection;
S/T support for the implementation of GMO legislation
Community Reference Laboratory for GM Food and Feed

Institute for Reference Materials and Measurement;
World leader in GMO Certified Reference Materials
and biometrology

Institute for Prospective Technological Studies;
Biotechnology foresight;
Model simulations and expert opinions on the co-existence of
GM and non-GM crops in European agriculture



Salient points of the EU regulation: a strict regulation with a strong consumers' involvement



- Labelling of GMOs and derived food and feed products at all stages (when present above 0.9%);
- Traceability from the point of production or import down to the table and vice versa;
- Co-existence between organic, traditional and GM plant from the seed throughout the production chain;
- Post-market monitoring;
- Extensive exchange of information on GMOs cultivated among MS and the EC and GMOs transported among MS and Third Countries (“Biosafety Clearing House”)





Community Reference Laboratory for GM Food and Feed

- **Operations are carried out, aligned with the European Food Safety Authority;**
- **CRL has a crucial role in (dis)approval of methods that are “fit for the purpose of regulatory compliance”;**
- **It has a role in disputes and in response to crises;**
- **It is unique in the international GMO regulatory system;**
- **It chairs the “European Network of GMO Laboratories” (ENGL);**
- **It carries out extensive training programs;**

- **Validation of methods for GMO detection is prime role.**

The European Network of GMO Laboratories



- All 27 EU (+ Norway, Switzerland) are members and member states' national networks are associated (> 100 participating laboratories) ;
- Observers from Tunisia, Morocco, Turkey, China, Malaysia, International seed testing association;
- 2 plenaries and several WG meeting group meetings per year cover sampling, interpretation of thresholds, expression of GM percentage, method uncertainty, reference materials, unapproved GMOs, etc.
- Chaired by the EC and managed by a Steering Committee;
- ENGL provides extensive support to the CRL, e.g. in method validation, acceptance criteria etc.
- Links with ISO – CEN – Codex Alimentarius

Members from Slovenia of ENGL



- **Members from Slovenia: National Institute of Biology (Ljubljana)**
- **Agricultural Institute of Slovenia (Ljubljana)**

Both are nominated as NRL according to Regulation (EC) No 1981/2006

Joint Publication in 2008 in Food Anal. Methods:
J. Zel et al.,: Method Validation and Quality Management in the Flexible Scope of Accreditation: An Example of Laboratories Testing for Genetically Modified Organisms

The role of the JRC in response to crises: the case of US GM-rice LLRice601



LLRice601 has been engineered to tolerate herbicides.

The product has never been commercialised.

GMO rice LLRice601 is neither authorised in the EU nor in the USA but it has been found in rice imported from the USA to the EU

The USA exports 50% of its rice produced. the USA.

The European Federation of rice millers tested its rice stocks and found approximately 20% positive samples

The role of the JRC in response to crises: the case of US GM-rice LLRice601 - continued

The JRC collaborated with the USDA and ENGL;

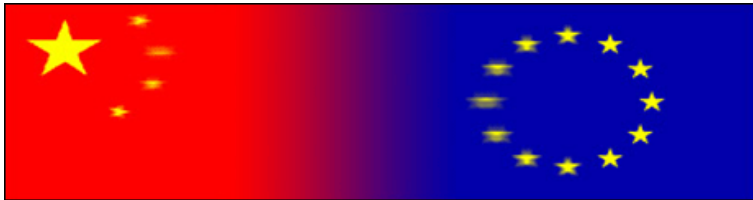
The JRC tested and published two detection methods on its web site;

The JRC distributed immediately control samples to the national control laboratories;

The JRC elaborated appropriate sampling plans.



The case of Chinese GM-rice



- **GM rice from Chinese origin had been found in the EU in Chinese supermarkets;**
- **The JRC works together with the Chinese authorities to have access to verified control samples and to a validated detection method;**
- **Exchange of molecular data – databases – protocols;**
- **Joint validation studies – proficiency tests;**
- **Participation in meetings (e.g. ENGL – CNGL).**

EUROPEAN COMMISSION
DIRECTORATE-GENERAL
Joint Research Centre

1st Global Conference on GMO analysis

1st Global Conference on GMO Analysis

Villa Erba, Como, Italy
24-27 June 2008

Conclusion

- **The work of CRLs contributes to consumer protection;**
- **Analytical controls are harmonised throughout Europe;**
- **Standardised methods deliver robust analytical results;**
- **Implementation of legal limits;**
- **Reduced number of analysis in EU Member States, e.g. at imports;**
- **Safe food products for the European consumers;**
- **Important to have reference laboratories for other consumer products.**

Co-operating Members from Slovenia in JRC-CRLs

- **CRL on Heavy Metals (Trace Elements): National Veterinary Institute & University of Ljubljana**
- **CRL on Mycotoxins: National Veterinary Institute & University of Ljubljana**
- **CRL on PAHs: Public Health Institute of Maribor & Environmental Protection Institute, Maribor**
- **CRL on Feed Additives: National Veterinary Institute**
- **CRL on Food Contact Materials: National Institute of Public Health, Ljubljana**

JRC Tasks on Food Safety and Quality

- **Community Reference Laboratories (genetically modified organisms (GMOs), food contact materials, feed additives, mycotoxins, polycyclic aromatic hydrocarbons (PAHs), trace elements)**
- **Method development, validation and harmonisation (e.g. BSE, GMOs, food allergens, mycotoxins...)**
- **Proficiency testing (e.g. acrylamide, food contact materials)**
- **Monitoring data bases (e.g. wine, acrylamide, PAHs)**
- **Reference materials and sampling plans**
- **Foresight studies (e.g. GMOs, cloned farmed animals)**
- **Support to emergency cases (crisis)**



THE EU WINE DATABANK



The EU Wine Databank - European Regulations

1989: (EC) No 2048/89 establishment of NMR (Nuclear Magnetic Resonance) Wine Databank

1993: COM(360) from the Commission to the Parliament and the Council for the creation of BEVABS at the JRC

BEVABS: European Office for Wine, Alcohol and Spirit Drinks
Bureau Européen des Vins Alcools et Boissons Spiritueuses



2004: (EC) No 2000: (EC) No 2729/2000 Laying detailed rules on control in the wine sector; (EC) 2120/2004 Enlargement of EU wine databank to New Member States (CZ, HU, SK, SL, MA, CY)

2006: (EC) No 2030/2006 Enlargement of EU wine databank to Romania and Bulgaria

EU Wine Databank and Slovenia

Slovenian liaison bodies for wine:

- **Data entry and transmission: Agricultural Institute of Slovenia, Ljubljana**
- **Isotopic analysis of hydrogen: National Institute of Chemistry, Ljubljana**
- **Isotopic analysis of carbon and oxygen: Josef Stefan Institute, Ljubljana**



Thank You for attention!

Thanks to my JRC colleagues for input to this presentation

