

To protect our health, we need reliable tools and methods to assess whether the food we eat is safe and of high quality.

New analytical methods are emerging that offer high throughput and easy handling solutions for industry and control authorities. Complementing traditional methods, these new rapid methods allow on-site testing of food quality and safety. However they are not widely established and the short life time of test kits means new cost and efficiency issues as well as different validation procedures.

For consumers and the food industry alike to benefit, it is essential that we develop procedures and define requirements for evaluating new methods with respect to reliability and performance including accuracy, repeatability, reproducibility and robustness.

One of our main goals is to reach a consensus for validation procedures and standards in food analysis.

## Horizontal Issues



### Indicative questions that MoniQA aims to answer are:

- Do methods fulfil performance criteria?
- Has uncertainty been calculated?
- Have sampling procedures been defined?
- Are methods sufficient for Q&S control in terms of traceability?
- Do detection limits cover legislation requirements?
- Has the cost of the method been estimated?

## MoniQA priorities on Food Quality and Safety related to analytical methods

Analytical methods cover a wide spectrum of food quality and safety issues. MoniQA has selected seven for closer examination. Additionally, socio-economic issues will be considered as a cross-cutting factor in all working groups.

### Microbiological Contaminants

The presence of bacteria, fungi, viruses, parasites and other microorganisms causes deterioration of food products and may have health implications for consumers.

*Campylobacter*, *Salmonella*, *E. coli*, *Norovirus*, *Vibrio*, *Bacillus cereus*, *Listeria*, *Staphylococcus*, *Clostridium perfringens* and *Yersinia* are a major issue in food quality and safety. New rapid and alternative methods for such contaminants are needed throughout the food supply chain. However, market acceptance is a major problem because of complicated, time-consuming and expensive validation and standardisation protocols, different validation requirements, and official standardised methods.

MoniQA is assessing the current status of new and rapid methods for microbiological contamination, defining the discrepancies and determining how these disadvantages may be overcome in the future. The overall aim is to provide a comprehensive pool of information and offer solutions that simplify and speed up validation of new methods.

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**Co-Leader:** Sue Paulin (ESR), NZ

### Mycotoxins and Phycotoxins

Mycotoxins are toxic metabolites of filamentous fungi whilst phycotoxins are toxins produced by algae – both may contaminate foods. MoniQA will provide guidelines for the evaluation of analytical methods, with particular reference to rapid test kits, suitable for mycotoxins and phycotoxins. The guidelines will address:

1. The Stakeholder Environment including general legislative considerations, the law concerning mycotoxins and phycotoxins specifically, and consequences for stakeholders
2. Sampling in the context of the stakeholder, sample collection and sample handling in the laboratory
3. Method performance including parameters for method validation and parameters required by accreditation bodies as well as measurement uncertainty

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**Co-Leader:** Michele Solfrizzo (CNR-ISPAA), IT

### Chemical Contaminants

Chemical contaminants cover a wide range of methods and individual contaminants exist within these areas which fit broadly into three groups:

1. Pesticide residues
2. Veterinary drug residues
3. Environmental contaminants

The MoniQA consortium has agreed on a set of priorities for comparison of selected methods including method performance, quality assurance and control, sampling, uncertainty, legislative aspects, traceability and harmonization (horizontal issues). Other priorities, relevant to specific classes, will also be investigated.

The major challenge is the vast size and range of the chemicals covered. Therefore a general approach will be used so as not to exclude any methodological approaches or classes of chemicals.

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Martin Rose (CSL), UK  
**Co-Leaders:** Philippe Delahaut (CER), BE  
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## Food Allergens

Food allergies and adverse reactions are a major concern for allergic consumers, the food industry and enforcement authorities.

Reliable detection and quantification of allergens is essential in order to comply with labelling regulations. In collaboration with all stakeholder groups the MoniQA working group 'Food Allergens' compiles information about the most important food allergens, prioritises gaps, identifies requirements and develops harmonisation guidelines.

The search for adequate allergen detection tools faces several challenges and issues including:

- (1) The lack of certified reference material
- (2) Antibody recognition of processed food (matrix dependence)
- (3) The need for an improved validation procedure and
- (4) The lack of clinical or analytical thresholds.

MoniQA intends to develop ways to close these gaps and harmonise approaches suitable for all the stakeholder groups concerned.

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## Food additives and processing toxicants

Food additives are added to foods for technological purposes. Processing toxicants or contaminants are substances formed during food processing (e.g. heating).

'Hot issues' amongst food additives include colours, preservatives, antioxidants and sweeteners. Carbon monoxide and hydrogen peroxide, which are used as processing additives, will be examined because they constitute a serious hazard. Amongst processing toxicants, acrylamide, trans-fatty acids and nitrosamines will be reviewed because they attract high scientific and consumers interest.

MoniQA will focus on the definition and evaluation of (1) rapid, screening and/or high throughput methods; (2) methods for multi-component analysis; and (3) methods using state-of-the-art instrumentation for better accuracy and selectivity, as well as lower detection limits. Other issues include additives of commercial interest, those that are in use despite restrictions (e.g. colours), and those for which there is no upper limit (quantum satis) or acceptable daily intake defined. Development of short courses on food additives will also be considered.

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## Food Authenticity

This term refers to whether the food purchased by the consumer matches its description (often defined by legislation). Tradition and identity play an important role in the definition of food authenticity. Thus whilst a food might be safer if produced with modern methods, the traditional method of producing the food is what makes it authentic. Consumers think of authentic foods as safe and often as synonym of a positive quality.

Guidelines on food authenticity include information about tools for measuring authenticity parameters, guidelines for food legislators, and dissemination of information to the consumer.

Some indicators of food authenticity may derive from genetics, territory (soil, climate, pollution etc.), harvesting and post-harvest treatment, processing conditions, and other functional ingredients affecting quality.

MoniQA wants to establish how authenticity can be measured and how we can distinguish between authentic and non-authentic foods.

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## Qualitative method validation

Qualitative methods are understood to be those that provide a measurable answer to a given question. MoniQA aims to establish guidelines for the validation of qualitative methods and the performance of validation studies. Two topics will be addressed:

- 1) Method performance characteristics of qualitative methods
- 2) Specific challenges for the validation of qualitative methods including (a) purely qualitative method (evaluation of results based on purely qualitative evaluation – yes/no decisions) and (b) qualitative methods based on a quantitative measurement

MoniQA will focus only on qualitative methods using real-world examples of method validation studies to apply statistical assessments. Special emphasis will be given to estimation of the prediction error of the percentage rate of correct results at the estimated level of dosage.

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For further information please visit our website:

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