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Support for a European metrology network on food safety Food-MetNet

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ABSTRACT

This paper describes Food-MetNet, a coordinated preparatory initiative to establish the European Metrology Network on Food Safety (EMN-FS). Food-MetNet aims to establish a long-term ongoing dialogue between the metrology community and relevant stakeholders, in particular, European Union Reference Laboratories (EURLs), National Reference Laboratories (NRLs) and the Joint Research Centre (JRC). This dialogue is meant to support the collection of needs from stakeholders, the take-up of metrological research output and the development of the roadmaps needed to navigate future research.

1. Introduction

The central objective of EU food policy is to provide food, which is safe, nutritious and traceable. Combining metrological research with industrial needs will create a shared vision to face the current and future food-related challenges. This vision is what Food-MetNet, a new coordinated preparatory initiative for a European Metrology Network on Food Safety (EMN-FS), aims to achieve the establishment of a long-term continuous dialogue between the metrology community and relevant stakeholders like the European Union Reference Laboratories (EURLs), National Reference Laboratories (NRLs) and the Joint Research Centre (JRC). Equally, there is a need to address specific concerns in food science in a coordinated way to guarantee traceability to the System of Units (SI), reduce measurement uncertainty, and improve analytical reproducibility for different food matrices (e.g. contaminants, nanoparticles, or pathogens in food matrices). These actions require a strategic plan on what and where National Metrology Institutes/Designated Institutes (NMIs/DIs) should focus limited resources (since no single NMI or DI alone can tackle all critical priorities) to obtain maximal societal impact. Coordination at the European level is vital for the success of this framework and for the enforcement of new legislation, reference methods, and materials to ensure food safety. Timely data collection, accurate predictive models, and the appropriate metrology toolkit can reduce issues along the food chain and identify potential health risks. A future network EMN-FS may well support and even partly direct the request for increasing the number of Calibration and Measurement Capability's (CMCs) in the food safety field and make new measurands amenable to being traceable in the future.

This paper aims to present the key characteristics of Food-MetNet and its impacts on the societal needs related to food safety controls.

2. The main objectives of the Food-MetNet

Food-MetNet aims to accelerate the realisation of the European Metrology Network on Food Safety (EMN-FS) by achieving the following objectives:

1. Establish regular, constructive dialogue and liaison between stakeholders in food safety metrology, including leading authorities such as the JRC, EFSA [1], EURLs and NRLs, and IUPAC and standardisation bodies. This work includes the nurturing of existing liaisons, promoting new collaborations while at the same time identifying and prioritising stakeholders' needs. However, achieving this aim will require a single voice for Europe.
2. Develop a Strategic Research Agenda (SRA) for the EMN-FS and roadmaps to address outstanding metrological requirements along the food chain, taking into account feedback from stakeholders (Objective 1). It will also identify current and future challenges in food safety and existing activities in existing infrastructures, such as METROFOOD-RI, a European Strategy Forum Research Infrastructures (ESFRI) for Promoting Metrology in Food and Nutrition.
Develop an efficient and regularly updated web-based platform for stakeholders (Objective 1). The platform will be used for knowledge and technology transfer, promotion of metrology activities, and as a forum for discussion. The platform will include easy access to European metrology capabilities, relevant food markers and regulatory requirements, e.g., Regulations (EU) 2017/625, 178/2002, 1169/2011 and 2015/2283, to maximise the up-take of the EMN-FS results by stakeholders [2–4], and provide a service desk for answering stakeholders' queries. The platform will be designed to be maintained by future EMN-FS.
3. Establish a programme of sustainable knowledge-sharing events for food safety stakeholders to disseminate information, particularly standards development organisations (SDOs), food safety authorities, and reference laboratory networks. This programme will include a range of activities regularly hosted by the project, such as the exchange of researchers between organisations, metrology workshops, stakeholder events, and training courses. Possible topics could include the issues faced by existing EURLs, chemical contaminants and pathogens, and emerging issues such as nanoparticles in food.

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4. Formulate a roadmap for a joint and sustainable metrology research infrastructure for food safety via an EMN-FS. The plan will be delivered 12 months after the start of the project. It should: (i) use coordination and smart specialisation of its core capacities, (ii) align with other active initiatives and projects, (iii) promote the development of emerging member states, and (iv) consider how to extend collaboration to other non-EU countries.

3. Expected results and impacts

The foreseen specific results of the Food-MetNet are the following:

1. **Stakeholder consultation:** Engagement of regulatory bodies, EURLs and NRLs that deal with the European food control system, industry, manufacturers and food retailers to create synergies with the metrology community and take advantage of the harmonised outputs of the EMN-FS. It will also create an active stakeholder consultative board capable of highlighting needs, cancel ambiguities and the false perception of the network activities and scopes. Also, it will enable EURLs and NRLs to be protagonists in drawing up a list of key measurement procedures and reference materials on which the European metrology community should focus as part of a Strategic Research Agenda (SRA) for the EMN-FS.
2. **Prepare a SRA:** The Food-MetNet will produce a SRA for the potential EMN-FS, including upcoming requirements that will be identified and prioritised through consultation with regulatory bodies, EURLs, NRLs and other relevant players in the food control system. Based on the SRA, the EMN-FS will drive the metrological research and activities to recognise the value of the metrological research outputs since they will be products of the consultation, thus boosting research uptake and impact. The process of stakeholder consultation in developing the SRA will be documented, so that future revisions of the SRA will profit from the lessons learned from the initial exercise. The success of the EMN-FS in coordination with other initiatives such as the METROFOOD-RI will represent one voice for Europe to drive metrology in food safety.
3. **Develop a web-based platform:** A freely accessible online platform to increase knowledge transfer and dissemination of metrological activities in the food analytics sector to EURLs, NRLs, control laboratories up to end-users so that they can easily find reference measurement services, reference materials, measurement comparisons, project results, food-related activities and a web forum. The platform will represent a service area for answering stakeholder questions. It will also be developed in a manner that allows it to be maintained by future EMN-FS by committing all the interested parties to support and actively use the platform.
4. **Disseminate and promote uptake of information:** to prepare the EMN-FS, within which a range of activities (e.g. the exchange of researchers between organisations, metrology workshops, stakeholder events and training courses) will be organised to set up a sustainable knowledge-sharing programme for food safety. These activities will be advertised on the website and by presentations at relevant technical committee meetings, workshops organised for EURLs, NRLs and stakeholders. A case study will be identified among the “hot topics” raised by the stakeholders and treated collaboratively.
5. **Support the set-up of the EMN-FS:** A plan for a joint and sustainable European metrology infrastructure for food safety via an EMN

will be developed during the first year of the project. Preparatory activities in the direction of EMN-FS will exploit fluent coordination and encourage smart specialisation of capabilities (e.g. CRMs, CMCs, reference measurement procedures) to encourage regulatory bodies to support ongoing and new standardisation activities. The network will operate at the European level while adapting to different national policies. A census of core competencies will also be performed, and engagement in collaborative studies will be encouraged and supported at all stages of the project. An open dialogue will also be established with other non-EU countries (e.g. USA, that have already expressed their interest in this project) to extend collaboration and harmonisation beyond the European borders.

3.1. Impact

The Food-MetNet Consortium includes nine NMI/DI partners from seven countries. It is coordinated by INRIM with the official starting date of June 1, 2021. The network is supported by 52 stakeholders who have expressed their willingness to participate through a letter of support. With such a strong consortium, Food-MetNet will improve food safety controls by enabling new metrological capabilities in food measurements and facilitating cooperation between the European players. The network will address the four main gaps in the current knowledge: legislation and regulation, analysis, harmonisation and coordination, consumer and market confidence. The project's impact is also ensured through dialogue with different stakeholders, namely reference laboratories, regulatory bodies, research infrastructures, food safety agencies, universities, and other research institutions. Relevant needs and issues will be communicated, and actions will be taken to address them. The industry will also benefit significantly. Through Unions of Chambers, industrial federations and associations, metrological know-how will be transferred to industry, allowing it to take advantage of new measurement protocols, validation processes, and access to Certified Reference Materials (CRMs), thereby increasing quality control and consumer confidence. The benefit and strength of Food-MetNet are in its cross-cutting approach, which will enable the preparation and certification of candidate reference materials, homogeneity and stability testing, storage and shipping, characterisation measurements, data evaluation and uncertainty calculation. Building synergies to create collaborative activities between Food-MetNet members, stakeholders, and other parties (providing training courses addressing relevant metrological aspects in emerging issues such as nanomaterials in food) will positively impact society. Research, reference and testing laboratories involved in the analysis of food contaminants will be able to access these services and compare their measurement results with reference data for accreditation purposes or gain know-how in a short time frame.

4. Conclusions

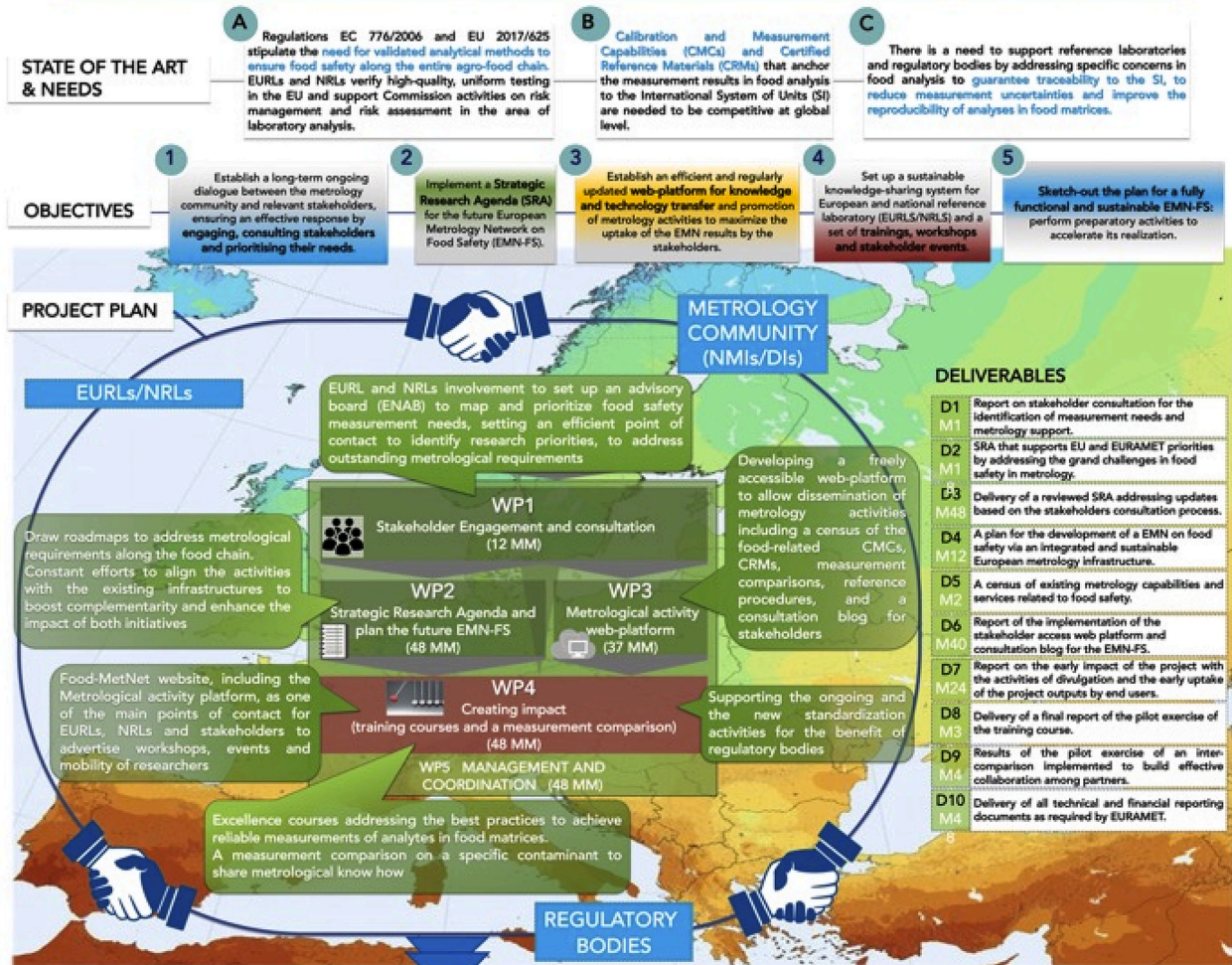
Because metrology is fundamental to trade and an essential component of economic, social, and sustainable development, Food-MetNet will reinforce Europe's research capacity by providing a solution for achieving harmonisation, quality, reliability, and reproducibility of food and nutritional data. This network is essential for quality control and traceability of food manufacturing which currently does not exist at the pan-European level.

JNP-w07

Support for a European Metrology Network on Food Safety Food-MetNet

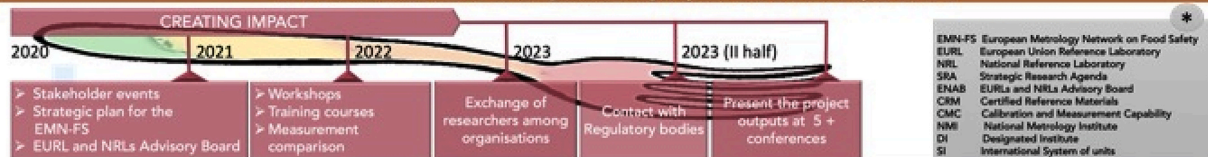
Coordinator: Andrea Mario Rossi,

Let's create ONE VOICE FOR EUROPE to drive METROLOGY in the FOOD SAFETY field



Launch of the European Metrology Network on Food Safety

EMN-FS will create a strong and cooperative system of institutions and infrastructures active in the food safety mission. This will represent a desirable opportunity to bring metrology to the field bridging needs to specific competences of the different players. Coordinated actions on food metrology in Europe are already aligning with parallel initiatives in America, Africa and Asia to start a worldwide dialogue, broadening to uptake radius over the European borders.



QUALITY AND EFFICIENCY OF CONSORTIUM

★ WP Leader ◆ WP Partner

| | INRiM | BAM | LGC | IJS | UME | METAS | PTB |
|-----|-------|-----|-----|-----|-----|-------|-----|
| WP1 | ◆ | | ★ | ◆ | ◆ | ◆ | ◆ |
| WP2 | ★ | ◆ | ◆ | ◆ | ◆ | ◆ | ◆ |
| WP3 | ◆ | ★ | ◆ | ◆ | ◆ | ◆ | ◆ |
| WP4 | ★ | ◆ | ◆ | ◆ | ◆ | ◆ | ◆ |
| WP5 | ★ | ◆ | ◆ | ◆ | ◆ | ◆ | ◆ |

Flags: Italy, Germany, United Kingdom, Romania, Turkey, Switzerland, Greece, Germany

JNPw07 on Food Safety is supported by 52 stakeholders

15 Reference Laboratories showed interest in joining Food-MetNet project as relevant stakeholders

7 NMIs and DIs support Food-MetNet as potential partners of the future EMN-FS

CEN/GENELEC showed its support to Food-MetNet as a key regulation body

METROFOOD-RI already declared its intention to join forces with Food-MetNet to enhance impact

25 ministries, institutions, universities demonstrated their interest in the Food-MetNet project

3 extra EU NMIs provided a letter of support for Food-MetNet project

Acknowledgments

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