Towards holistic, AI-driven emerging risk assessment: a multi-stakeholder perspective

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COLLECTING MULTI-STAKEHODER PERSPECTIVES IN VIRTUAL LABS

The role of AI in unravelling and managing food safety risks in the next future has been explored in the **Strategic Research and Innovation Agenda for Food Safety** in Europe (SRIA) recently released by the FoodSafety4EU project.

This agenda, focused on priority challenges in emerging food hazards and risks, is the result of a **multi-stakeholder co-creation workshop series** (*Food Safety Operational Lab*), involving more than 30 high level experts (from science/academia, industry, consumer associations, food safety authorities).

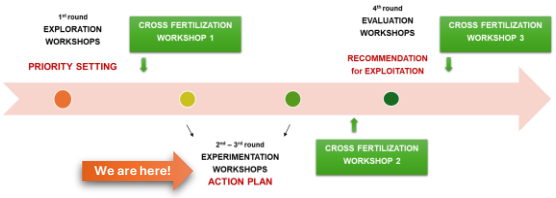
As a result of the pandemic, **the entire face-to-face lab process** (24 months) **was shifted to a virtual format**, that was proved to be highly effective. The so-called **Food Safety Operational Labs** were organised in learning cycles, each of them associated with a multi-actor workshop, hosting pilot actions.

Virtual Social Lab guide here: https://foodsafety4.eu/knowledge/practices/kers/

Also relying on the FoodSafety4EU experience the virtual living lab methodology was implemented in the **HOLiFOOD** project to activate a multi-actor co-design approach on:

✓**AI-driven emerging risk identification** *(living lab 1)*
✓**Holistic risk assessment and acceptance** *(living lab 2)*
✓**AI-driven digital platform codesign** *(living lab 3)*

Read more here: https://HOLiFOODproject.eu/citizen-and-societal/living-labs/



ROLE OF AI IN THE FUTURE EU FOOD SAFETY SYSTEMS – NEEDS FOR FURTHER DEVELOPMENT

SRIA condensed version here::
https://foodsafety4.eu/knowledge/practices/kers/

The **FS4EU SRIA envisages a key and cross-cutting role of AI** in the future EU food safety systems, that can be unfolded in several domains:

- **improving integrated risk assessment**, including the shift towards non animal methods;
- fostering the integration of emerging technologies for **traceability and rapid/early risk monitoring** along the food supply chain;
- **identifying, predicting, managing (re)emerging food safety risks** in relation to big drivers such as climate change, circularity of resources and transition towards sustainable food productions.

ENABLING FACTORS FOR A TRUSTED AI

- AI **expert groups** and **on-site training** along the food chain
- Appropriate **infrastructures for data** processing and storage
- **"User friendly" AI**: simplified and more intuitive interfaces hiding the technical complexities of machine learning
- Adequate, and where possible, **harmonized legislation** on data sharing and data protection, complemented by **harmonized and simplified data formats** and collection methods.

BENEFITS OF A TRUSTED AI

- AI can help food business operators to **adhere to strict regulatory standards and frameworks**, such as ensuring labelling accuracy and other critical quality standards
- AI can enable a **framework for safe and transparent data collection**
- A trusted AI can **boost a "data sharing culture"** encouraging industries to allow openness of data for use for the public good in **collaboration** with national agencies and research organization.

LL1
AI-driven emerging risk identification

Goal: Co-design of an AI based early warning and emerging risks prediction models based on a systemic approach, containing
- information on data sources,
- hazard types,
- potential improvement of performance by AI,
- requirements for success and trustworthiness
- risk identification with likelihood and time-scale (risk now or in 10 or 50 years)

Needs for further development:
- **Priority focus: understanding shift in risks, f.i. related to climate change**
- Hazards covered/to be covered: *heavy metals, pesticides, olive oil contaminants, environmental contaminants, microbiological hazards (bacteria, viruses, toxins)*
- Data from: environment, meteorology, cross-contamination, storage conditions
- Geographical and product specific models
- Confidence level in the data used – trusted case studies
- Use of existing data (data curation - interoperability)
- Feeding the models with new data – who? and what is the benefit in doing so?
- **Dialogue & Communication** - Translate AI findings in understandable language

LL2
Holistic Risk Assessment

Goal: **Co-design a framework to deliver validated, generic, responsive holistic risk assessment methods and tools** taking into account
- specific scope of RBA and what-if scenarios for selected supply-chains
- how stakeholders (risk managers, risk assessors, producers and citizens) prioritize different risks and what citizens' willingness to pay for risk reduction
- formats for the holistic assessment outputs

Needs for further development:
No real defined methodology for risk/benefit assessment of emerging risks, as starting point: identify best practices and further develop
- **Priority focus: microbial hazards, antibiotic resistance, heavy metals and pesticides**
- Define a priority list in terms of emerging risks (as they are emerging, data can be sparse)
- Define metrics to monitor them and influence of (big) drivers
- Use the drivers to build new scenarios
- Balance/adapt consumption to each consumer needs
- **Dialogue & Communication:** mitigate fears and incorrect information: zero risk does not exist –> RBA should provide balanced options in an informed way
- ***!! AI can be a tool but cannot replace classical modelling***

LL3
AI-driven digital platforms

Goal: **Co-design of a model of an integrated infrastructure that supports food risk mitigation decisions and fits multiple stakeholders needs,** taking into account
- existing digital infrastructures for interoperability/cooperation
- multi-stakeholder (end users) needs and expectations

Needs for further development:
- **Priority focus: federated AI engaging with target users of the infrastructure: industries**
- Anonymity of input data– accessibity of output data
- Availability/affordability to EFSA and risk assessors/public users
- User friendly interfaces
- Interoperability of tools and cope with GDPR issues, data protection law
- **Dialogue & Communication:** provide information on the trust in the outcomes by users

Do you want to get involved in the HoliFood LL process? Get in touch with:
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