METRO FOOD
INFRASTRUCTURE FOR PROMOTING METROLOGY IN FOOD AND NUTRITION

Integrated Research Infrastructures' initiatives in support to food quality and safety and sustainability of agrifood systems

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ENEA

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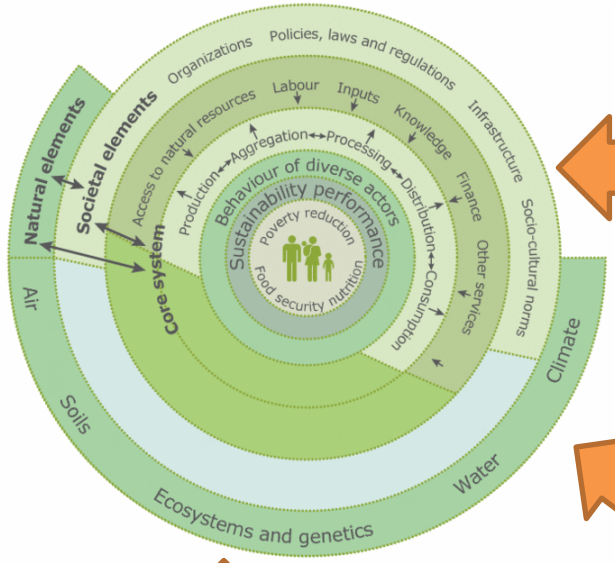
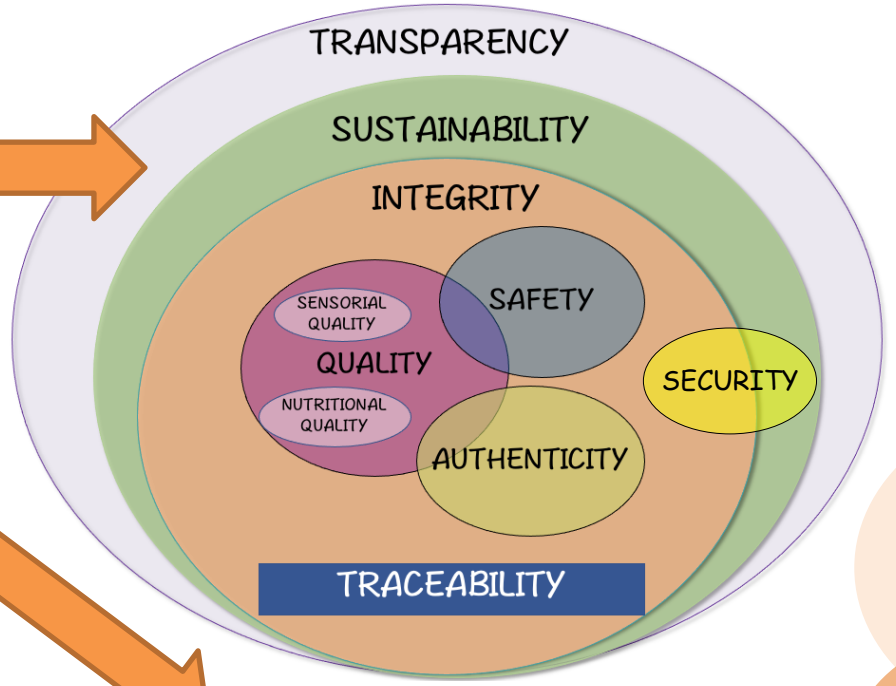
ISO Fd Food ERA Chair Safety Quality Traceability

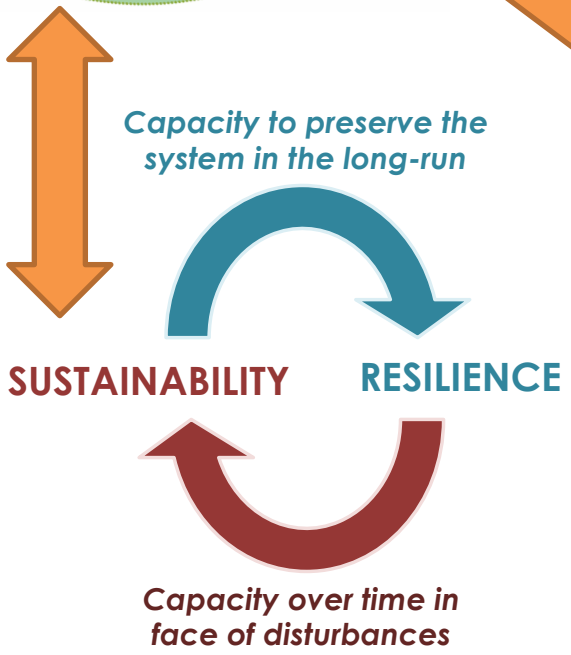
2nd ISO-FOOD Symposium
26•04•2023 – Portorož

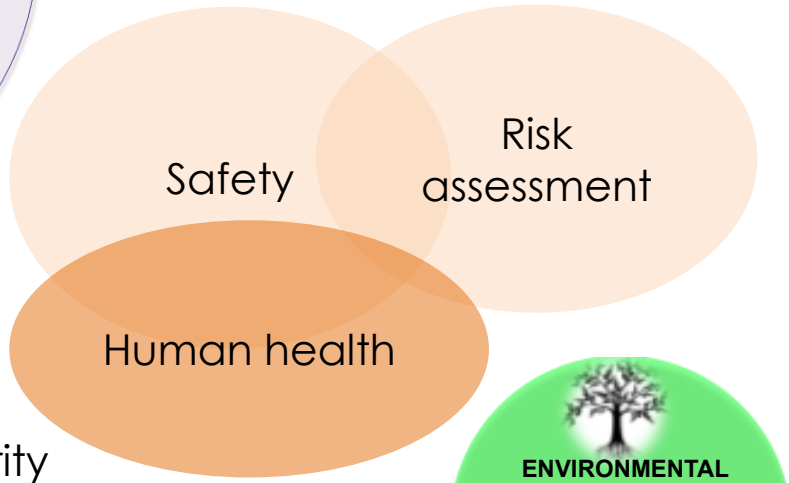
METRO FOOD Preparatory Phase

Agrifood systems' challenges





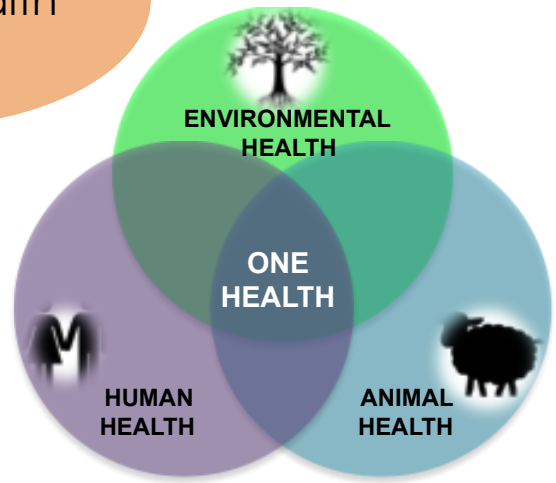




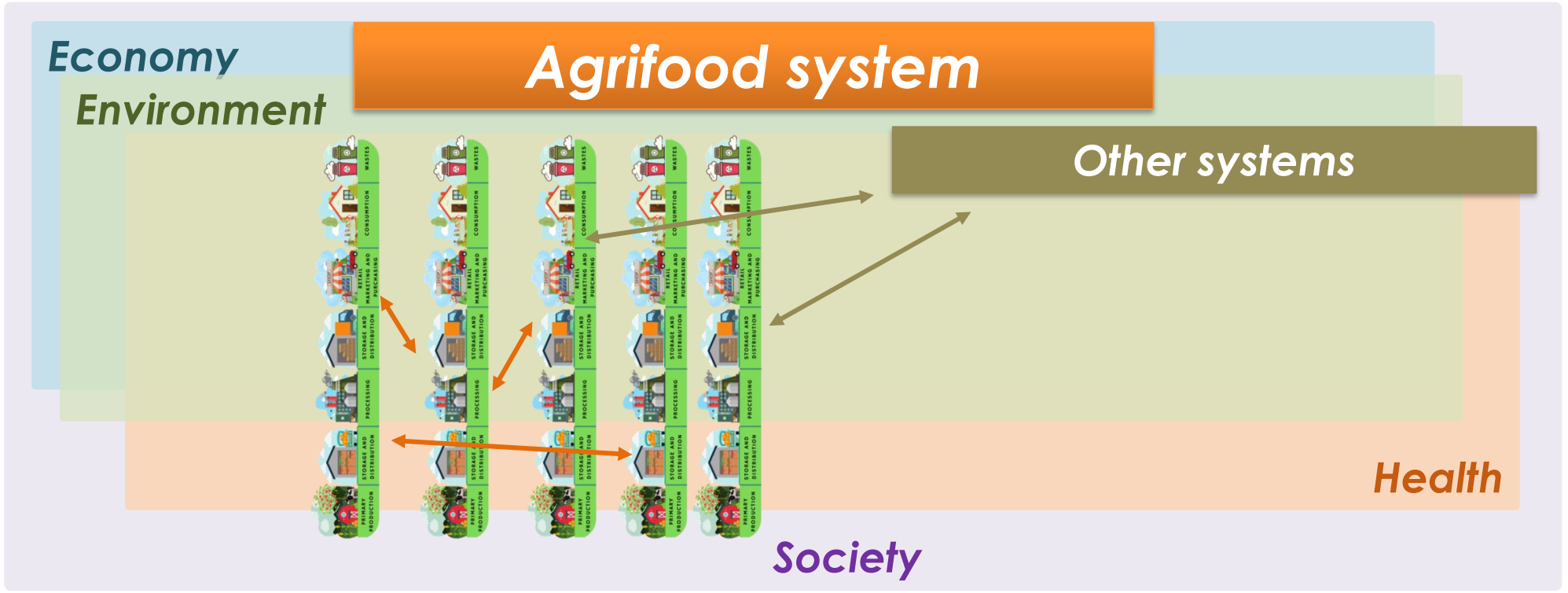
Security

Sustainability

Sovereignty



The “multiple” levels of agrifood systems



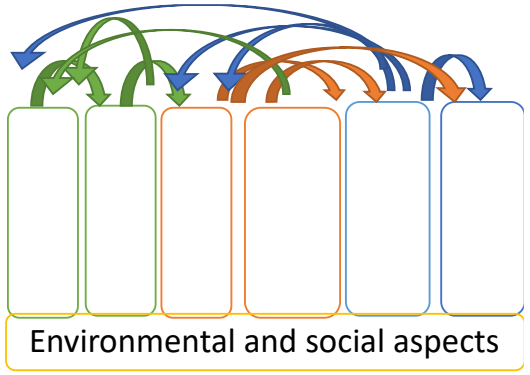
Global
European
Regional
National
Local

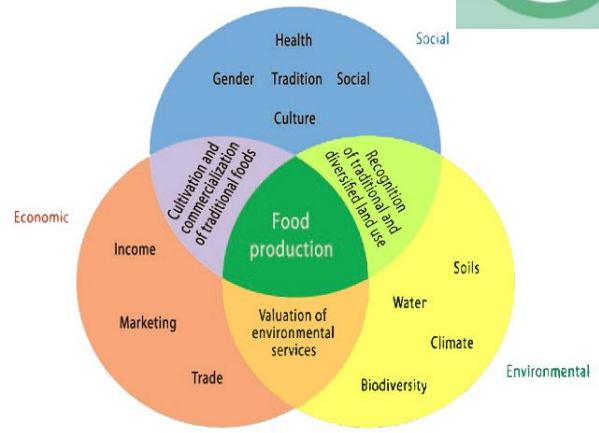
Social groups
Households
Individual

METRO FOOD
Preparatory Phase

Where to focus on

- **Environmental safety, climate changes and impacts on food safety, environmental impact of agrifood productions, sustainable management of territories**
- Development of sustainable agrifood systems & **agroecological transition towards a sustainable and resilient agriculture**
- **Improve food safety, food defense, food quality and production processes' control systems**
- Application of **new technologies** and effects on quality, safety & health; innovative **packaging** – sustainable, active and intelligent
- **Side streams and by-products** valorisation and **food losses** reduction; valorisation, traceability and re-use of **food surplus**
- **Transparency of agrifood productions**
- **Adoption of healthier and more sustainable diets**





Food production at the center of agroecology (Agroecology - Community Food Forests)

- **Development of new analytical methods; systems for early detections, in situ and in line measurements**
- **Promotion of harmonisation and standardisation**
- **Digitalisation** of agroindustrial systems**, big data** handling **& FAIR approach,** integrated application of **ICT systems** (smart sensors, IoT, Blockchain, AI, 5G, …)
- Application of **inter- e trans-disciplinary approaches, citizen sciences and co-creation**

- ✓ Policy makers, ministries and local authorities
- ✓ Inspection & control system
- ✓ Health system
- ✓ Researchers
- ✓ Producers
- ✓ Consumers/Citizens

RO FOOD Preparatory Phase

The role of Research Infrastructures

ESFRI European Strategy Forum on Research Infrastructures

ROADMAP 2021 STRATEGY REPORT ON RESEARCH INFRASTRUCTURES

*part of a **connected ecosystem** forming a unique resource for advanced research and interdisciplinary analysis of complex scientific problems*

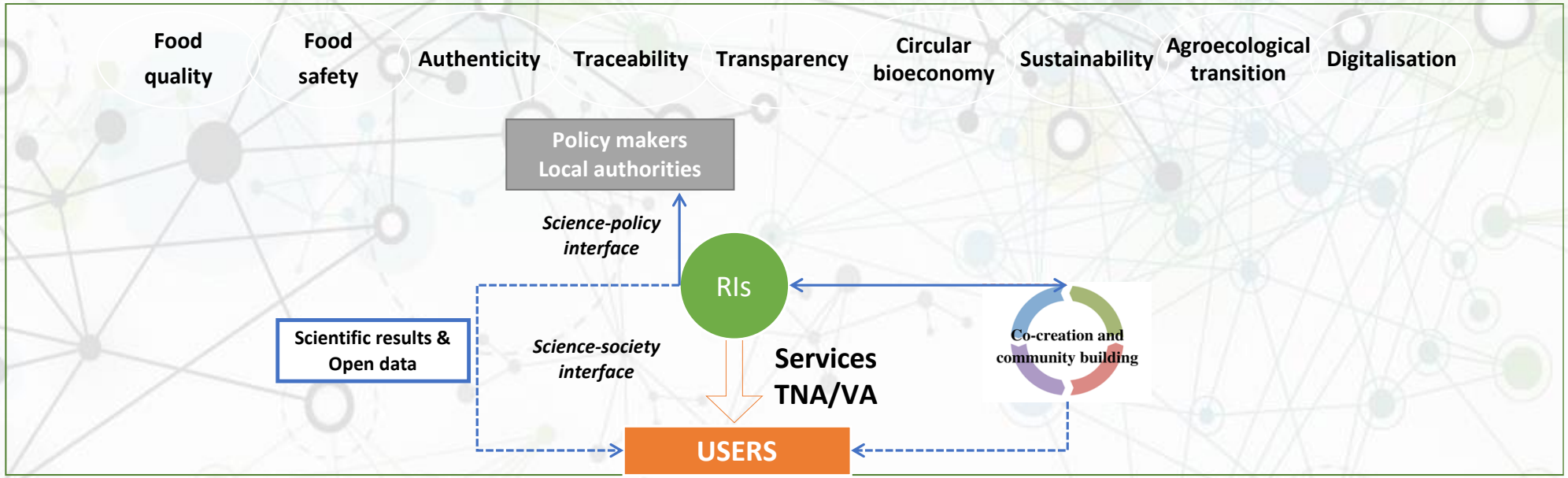
DATA, COMPUTING & DIGITAL RESEARCH INFRASTRUCTURES
ENERGY
ENVIRONMENT
HEALTH & FOOD
PHYSICAL SCIENCES & ENGINEERING
SOCIAL & CULTURAL INNOVATION

Service-oriented organisation

Innovation-oriented approach

Long-Term Sustainability

https://roadmap2021.esfri.eu/



METRO FOOD Preparatory Phase

The role of Research Infrastructures

ESFRI European Strategy Forum on Research Infrastructures

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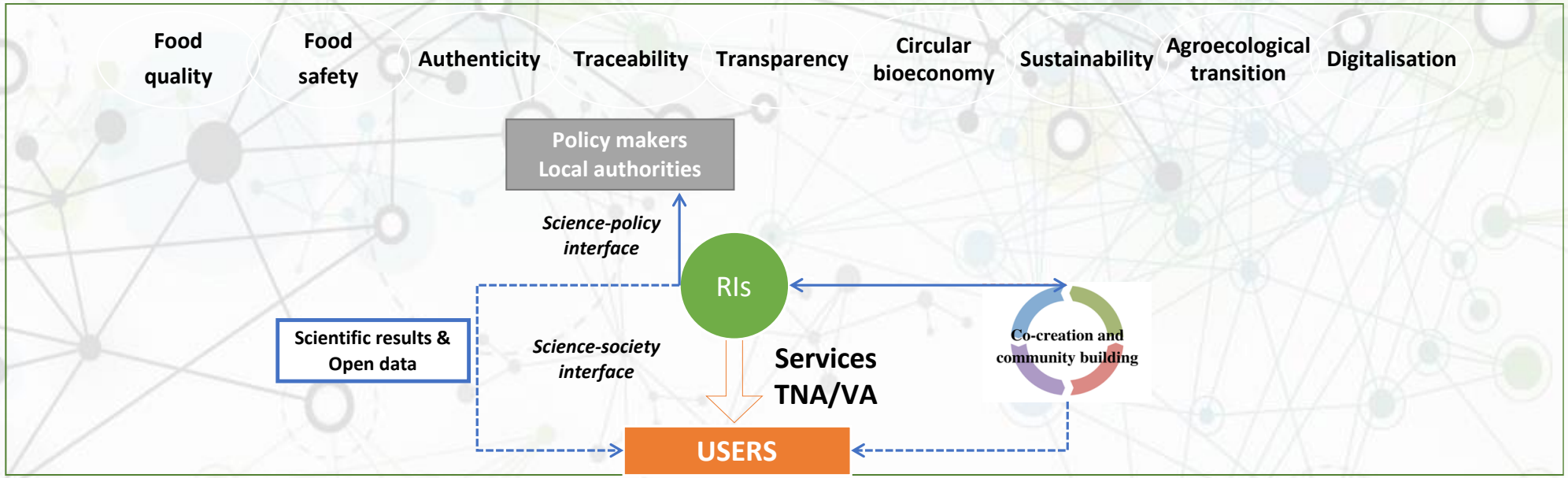


Research Infrastructures (RIs) have the capacity to provide resources and services for research communities on a long-term basis, making the RIs well positioned in addressing societal challenges

METRO FOOD Preparatory Phase

METRO FOOD

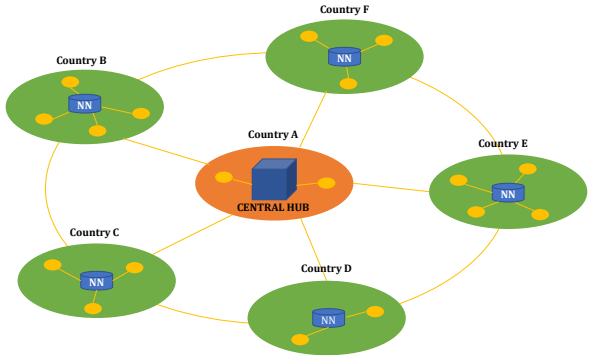
INFRASTRUCTURE FOR PROMOTING METROLOGY IN FOOD AND NUTRITION

ESFRI Strategy Report on Research Infrastructures ROADMAP

HIGH-LEVEL METROLOGY SERVICES IN FOOD AND NUTRITION FOR THE ENHANCEMENT OF FOOD QUALITY AND SAFETY

MISSION

- To enhance quality and reliability of measurement results
- To make available and share data, information and metrological tools
- To enhance scientific excellence in the field of food quality & safety
- To strengthen scientific knowledge, promoting scientific cooperation and integration



- IT
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- FI
- FR
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- NL
- NO
- PT
- RO
- SI
- TR

METRO FOOD

Physical-RI

Metro

- Plants and Labs for RM development
  - RM Preparation
  - Stability and homogenity studies
- Analytical Labs.
  - Sampling, pretreatment and storage
  - Food composition and characterization
  - Inorganic contaminants
  - Organic contaminants
  - Chemical and biological markers and profiles
  - Microbiological analysis
  - Development of sensors and devices
  - Environmental Analysis
  - Testing (rheological, leaching, etc.)
  - Other

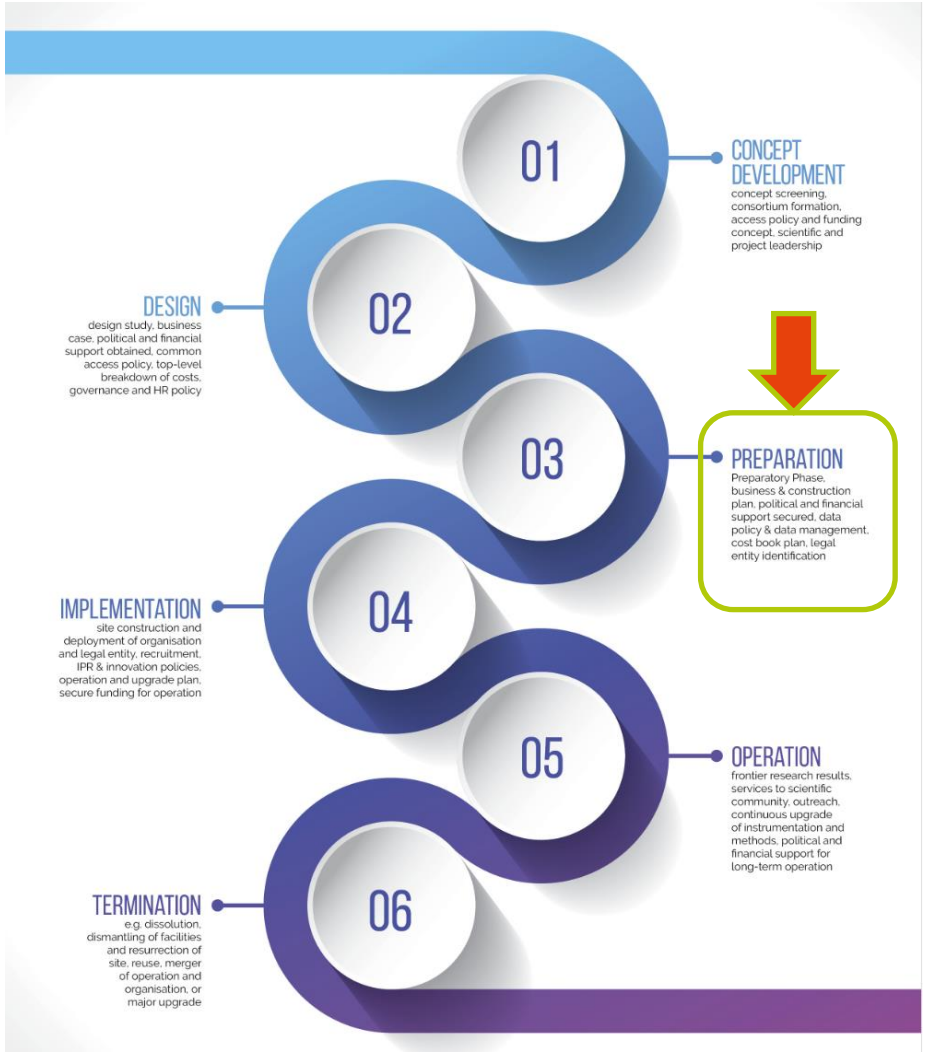
Food

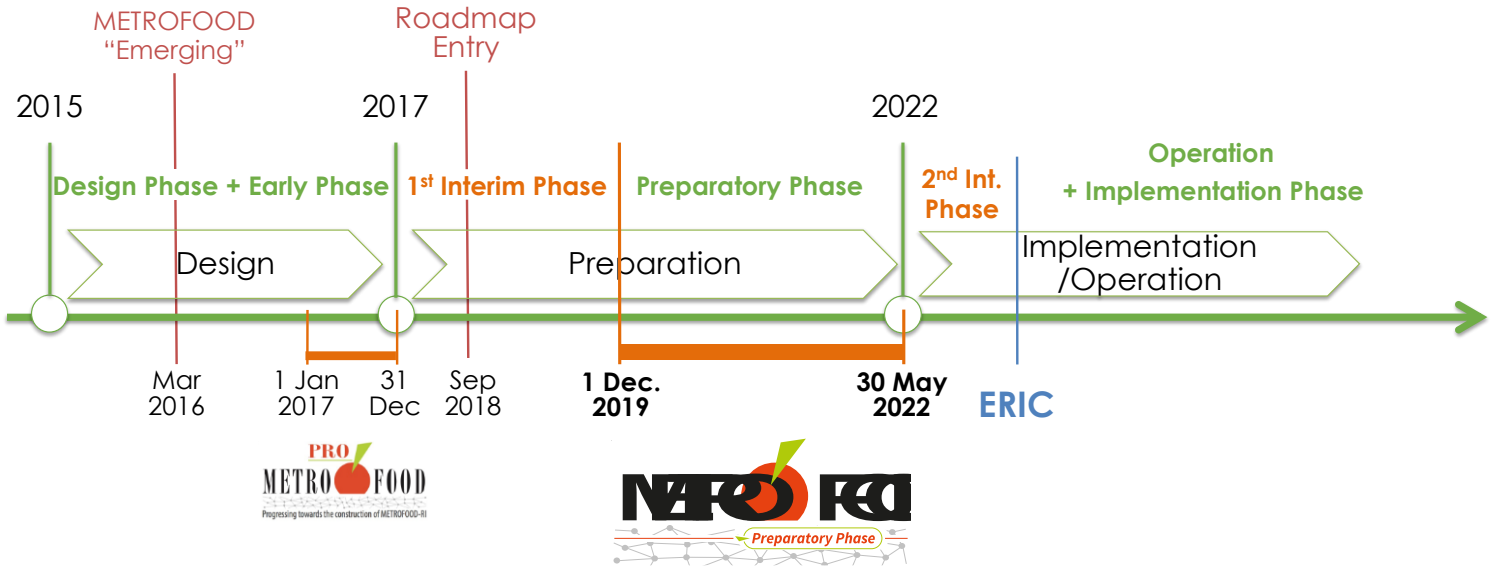
- Experimental fields/farms
  - Crop production
  - Animal breedings
  - Fish farms
- Facilities for food processing and storage
  - Industrial processing
  - Packaging
  - Supply chain and storage
  - Food preparation

e-RI

- Software development
  - development of new databases
  - Integration of existing databases
  - graphical interfaces development
  - database manteinance and updating
- Data collection
- Data analysis
- Management of Interlaboratory tests
- Diffusion and Training
  - Reference Materials
  - Official and Reference Methods
  - Reference Laboratories
  - Vocabularies, Guidelines and procedures
  - PTs Providers
  - Food composition
  - Contaminants in food
  - Food markers
  - Characteristics of production areas and technologies
  - Food consumption

Where we come from…

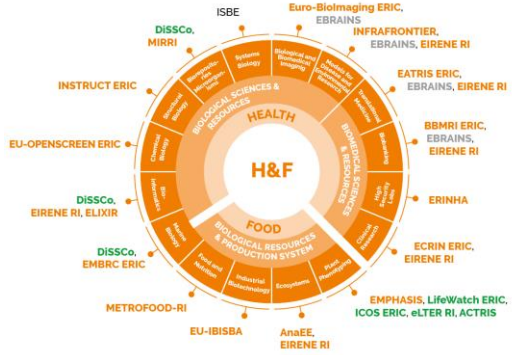


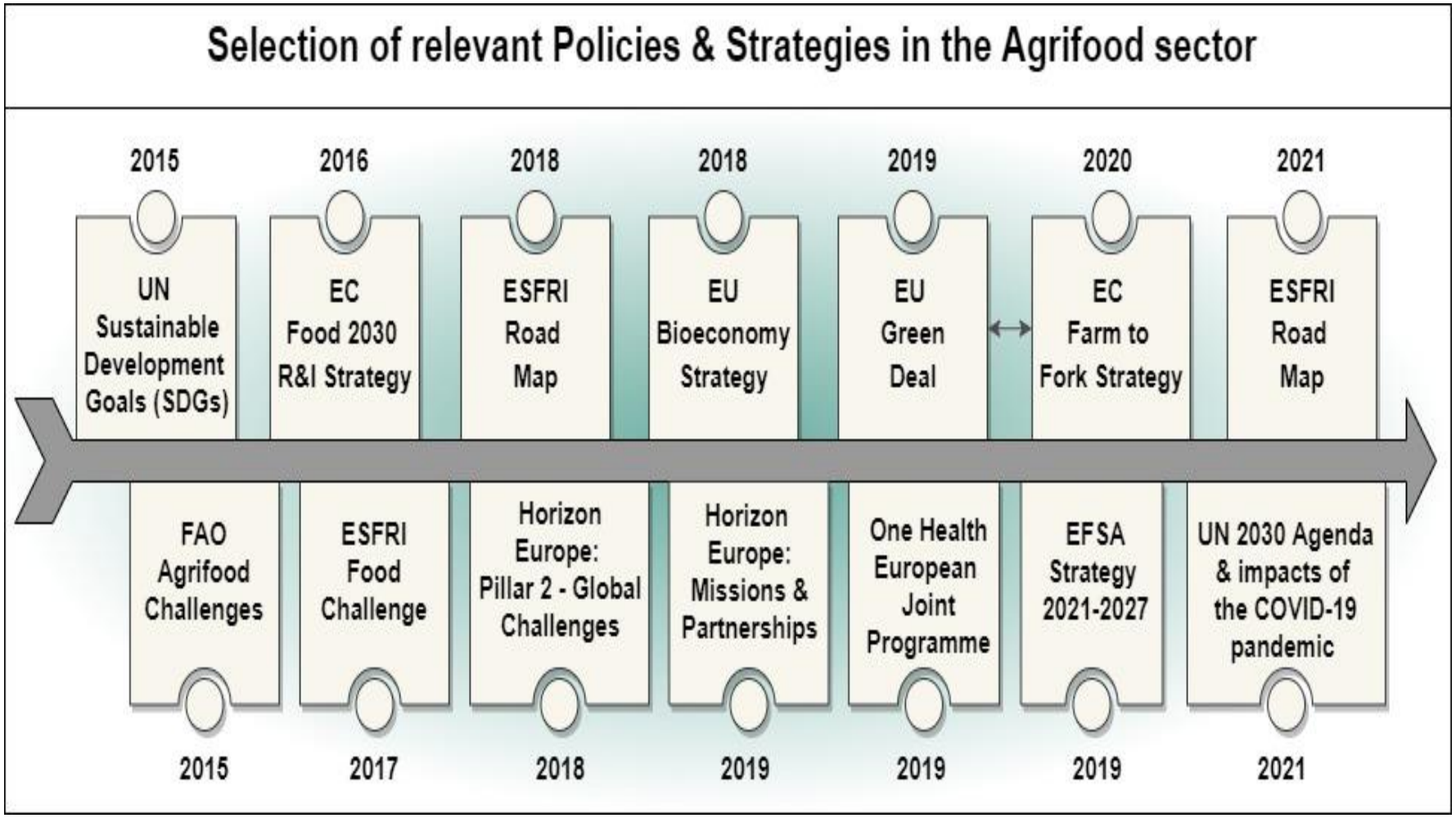


METROFOOD-PP has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 871083.

METRO FOOD
Preparatory Phase

Motivation and Challenges





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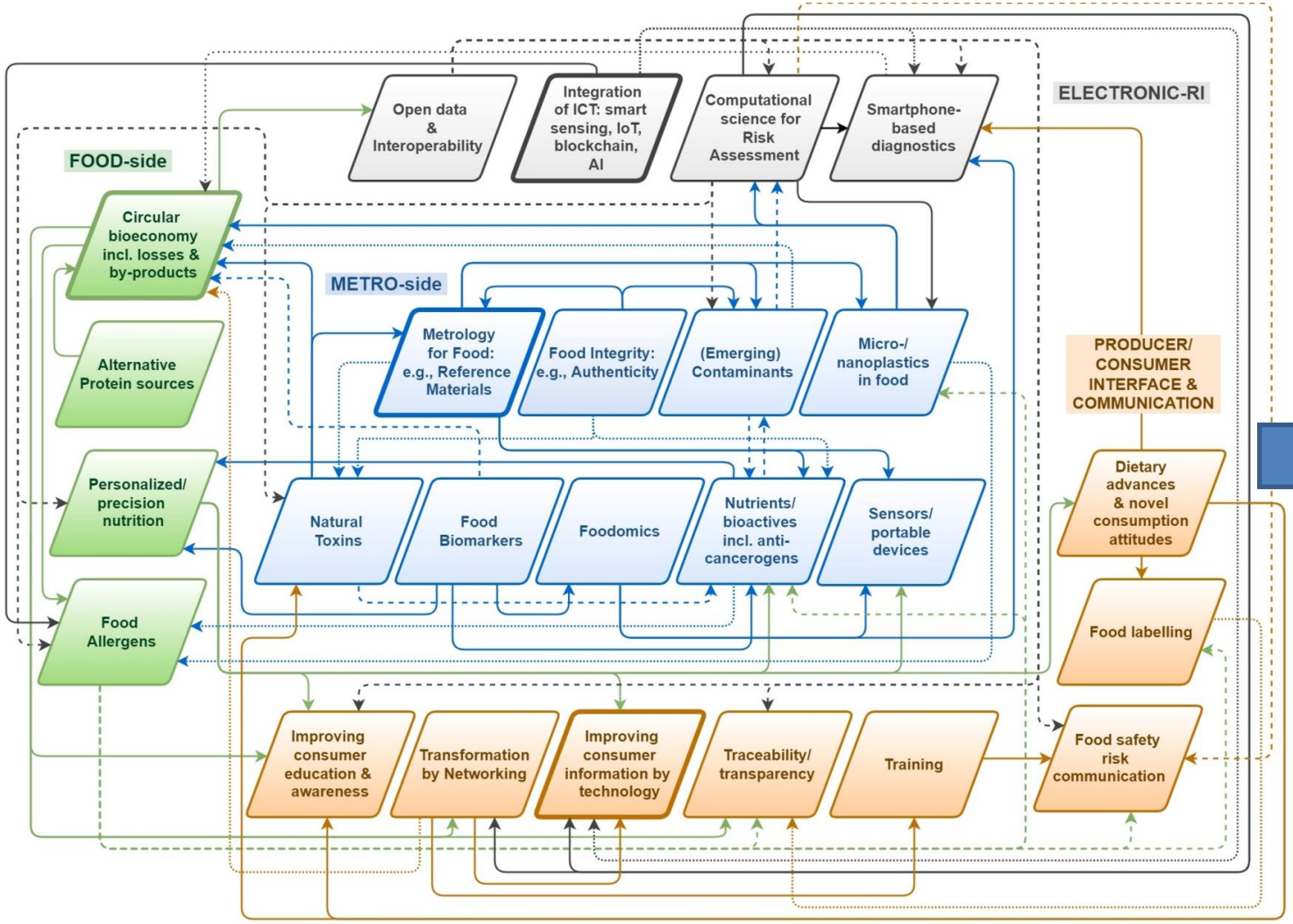
METRO FOOD Preparatory Phase

Network of Strategic Scientific Topics



https://www.metrofood.eu/images/preparatoryphase/SRIApro.pdf

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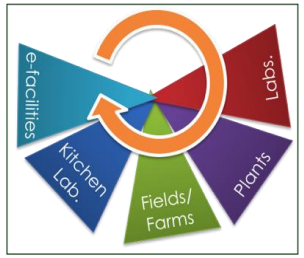
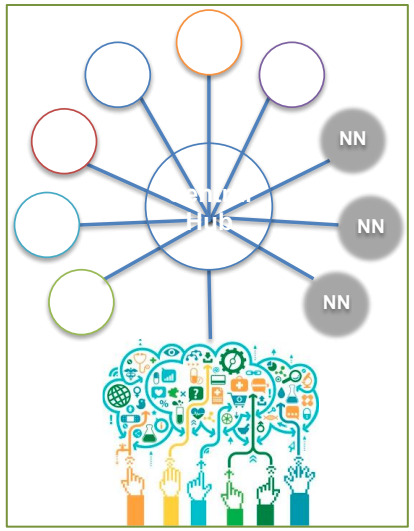
METRO FOOD Preparatory Phase

Services and Access



Findable Accessible Interoperable Reusable



POTENTIAL USERS

CORE SERVICES

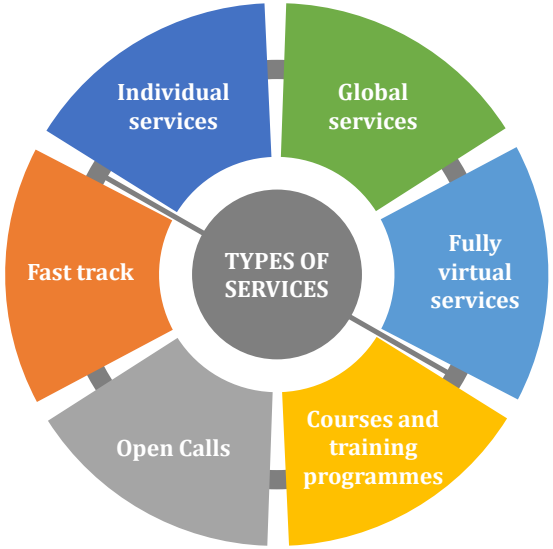
- **Primary food production**
  - Research on environmental impacts on food production, safety & quality
  - Novel foods & new techniques in food production
- **Food processing & kitchen labs**
  - Processing techniques to improve safety & quality
  - Food packaging & preservation
- **Analytical labs**
  - Authenticity determination/assessment
  - Omics-based analyses
  - Allergens
  - Mycotoxins (& other natural toxins)
  - Sensorial analyses
  - Organic compounds/contaminants
- **RM Plants**
  - Design, development and production of RMs
- **E-services**
  - Databases and tools

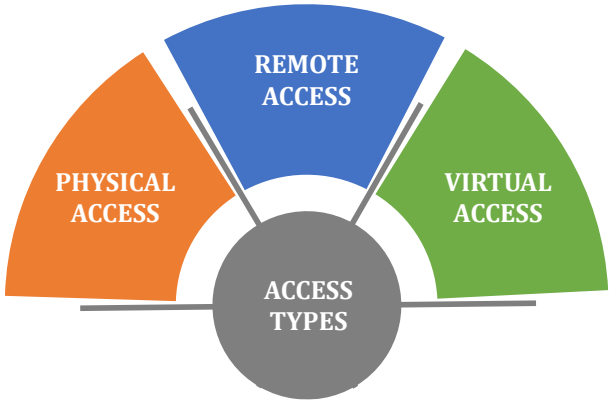
USE CASES SERVICES

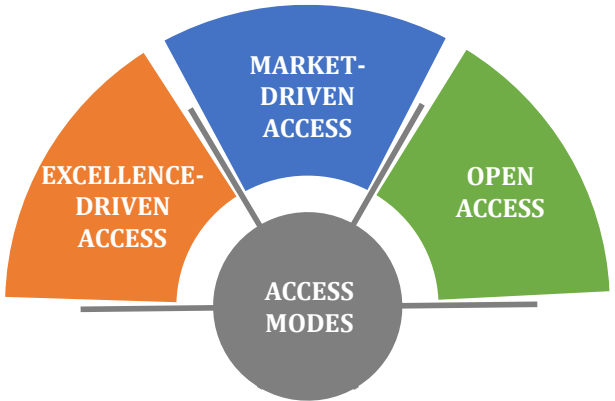
- Food pilot demonstrator
- Physicochemical characterization o nanoparticles in food
- RM App and risk assessment tool

INTEGRATED SERVICES

- Circular Bioeconomy
- Living Labs
- Food traceability and transparency
- Virtual access services

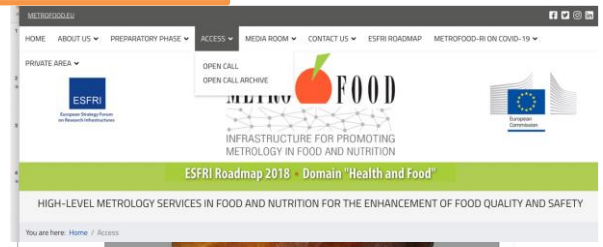






METRO FOOD Preparatory Phase

OPEN CALLS



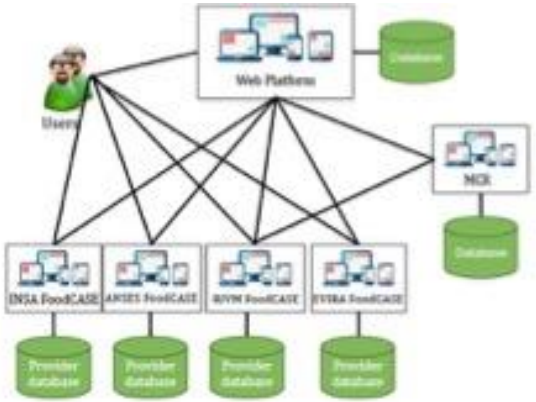
1st OPEN CALL – (25 July – 30 September 2020) - Remote access to transmission electron microscopy facility for physicochemical characterization of nanoparticles in food

2nd OPEN CALL – (25 July – 30 September 2020) -Physical access to food pilot demonstrator: how to minimize acrylamide in bakery products

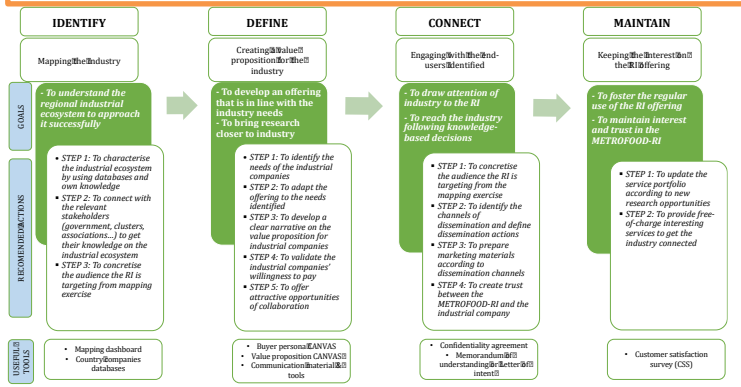
RM-App

https://www.metrofood.eu/access/e-services.html

TOOL TO INTEGRATE TDS SAMPLE DATA WITH MCRA



TECHNOLOGY TRANSFER GUIDELINES



METRO FOOD
Preparatory Phase

METROFOOD-RI next steps

ERIC Step 1 application (30 Jan 2023)

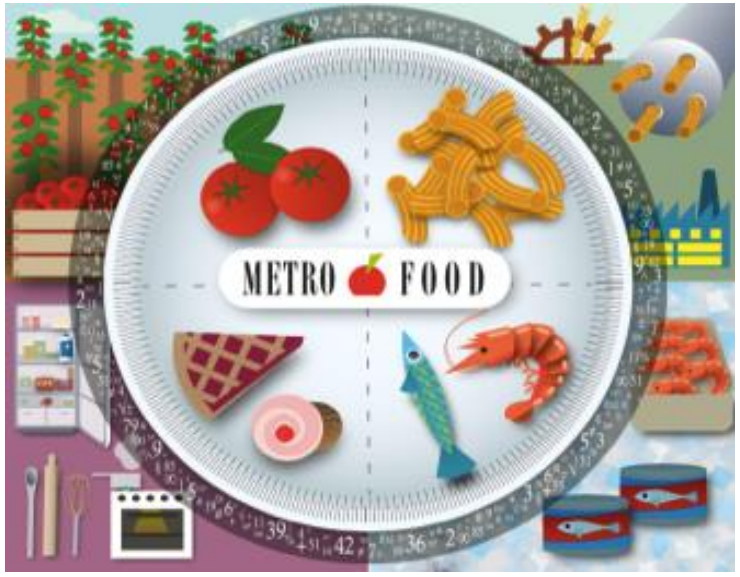
Interim phase (ongoing)

ERIC Step 2 application

METROFOOD ERIC establishment

Early Phase Implementation

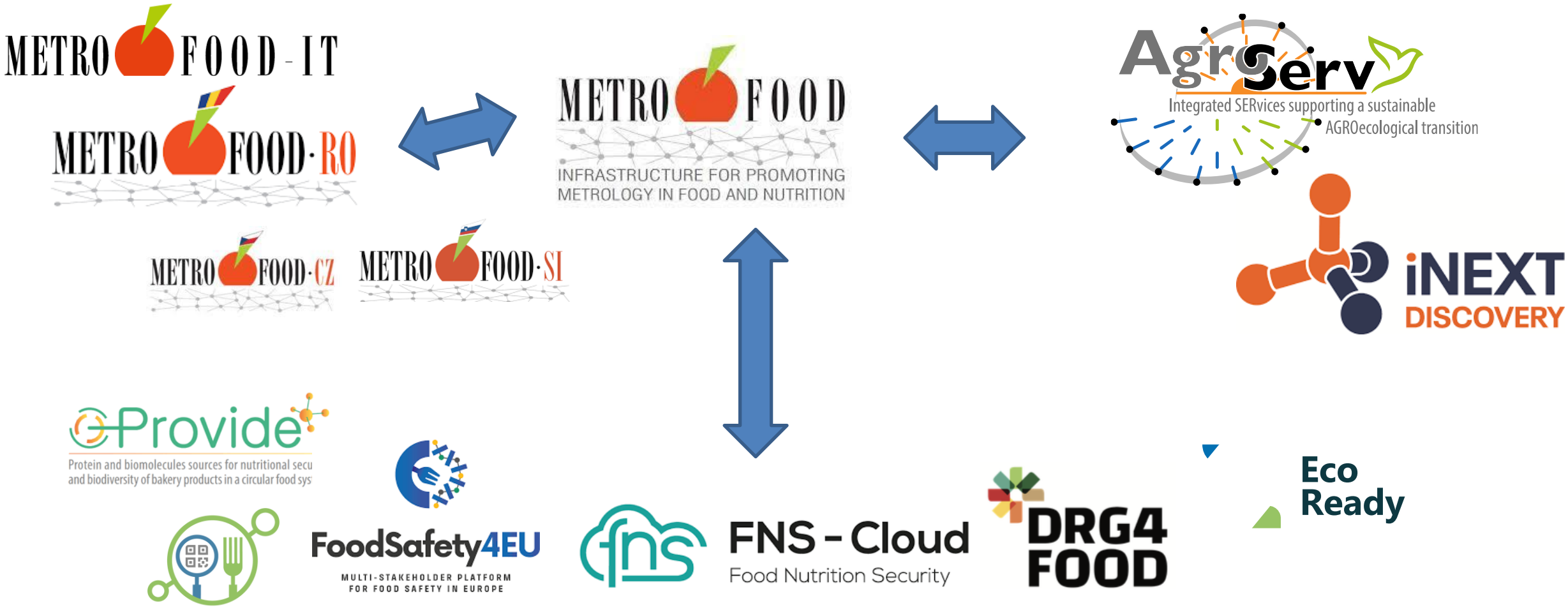
Implementation /Operation



- Providing high-level metrology **services in support to the agrifood**
- Promote **excellent science, research and innovation** on metrology in food and nutrition and in support to the agrifood
- **Developing the facilities** owned by METROFOOD ERIC together with all facilities made available to METROFOOD ERIC by the Members and Observers for undertaking activities to achieve the objectives of METROFOOD ERIC at European level to allow scientific communities and other interested stakeholders to **access the data and facilities** of METROFOOD ERIC
- **Integrating research, training, technology transfer and information dissemination activities**. METROFOOD ERIC shall be the central point of contact for research, training, education and dissemination activities in support to the agrifood, with reference, e.g., to **food quality & safety, authenticity, traceability, food transparency, circular economy, sustainability of agrifood systems**
- **Promoting the digitalisation of the agrifood systems, open data and the application of FAIR principles**
- **Establishing connections with international initiatives relevant in the field**, to act as the representative towards other parts to promote international cooperation
- **Synchronising investment and operational funds**, in a way to optimise national, European and international resources

The best opportunities arise from integration

Initiatives focused in integrating RIs knowledge, facilities and services can boost the definition of an integrated and structured landscape, promoting more and more advanced research and highest cooperation with and within the agrifood systems' stakeholders, thus enhancing the social-economic impact



Strengthening of the Italian RI for Metrology and Open Access Data in support to the Agrifood

PNRR - Mission 4 – "Education and Research" - Component 2: from research to business
InvesAction 3.1.1 "Creation of new research infrastructures strengthening of existing ones and their networking for Scientific Excellence under Horizon Europe

Duration: 30 months
Starting date: 1 Sett. 2022
Total funding: 17,79 M€

METROFOOD-IT Mission

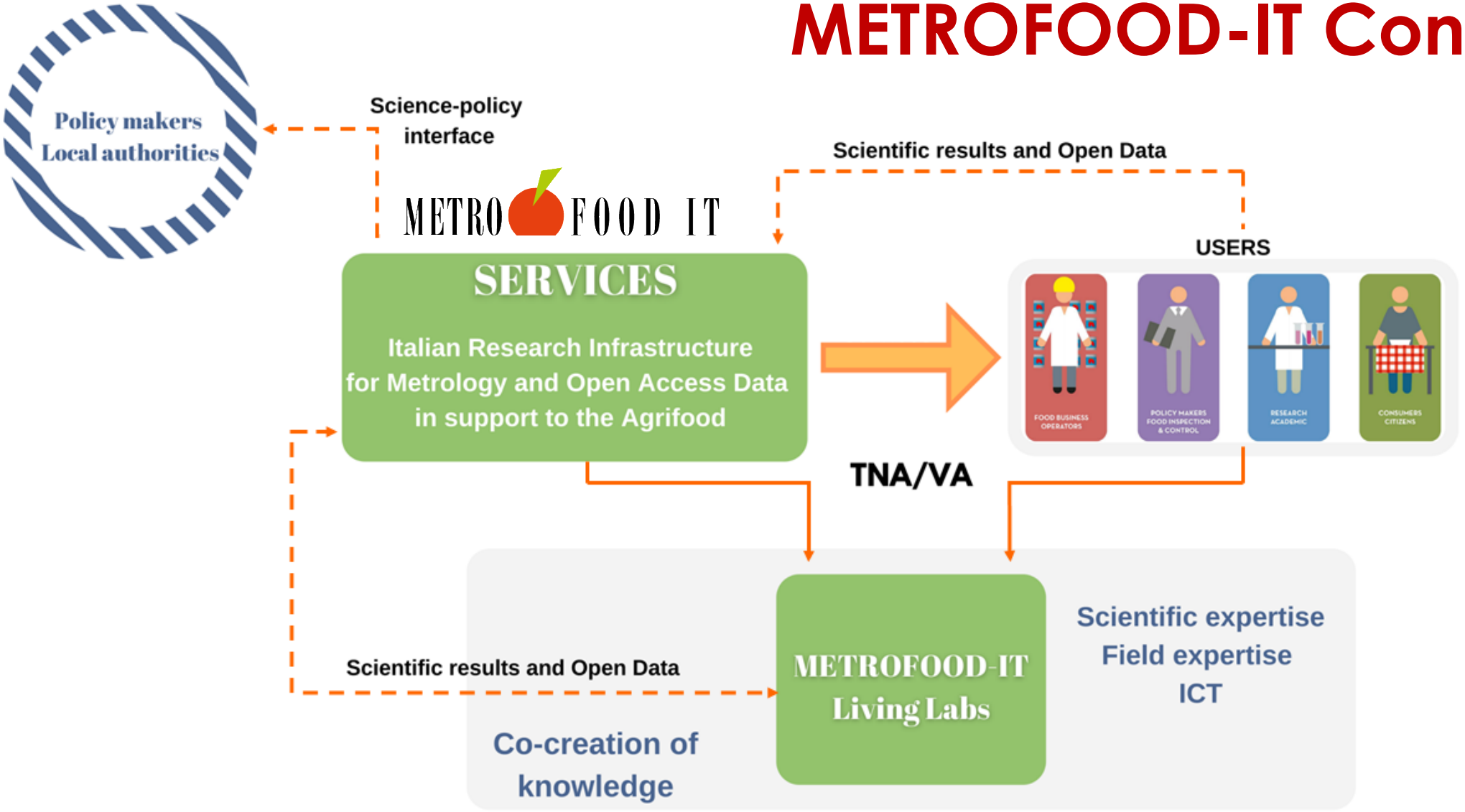
To support research and innovation in the agrifood by providing integrated services, boosting the digitalization of agrifood systems and their efficiency, traceability, and sustainability, increasing the reliability of products and processes and information provided to citizens, authorities, and food system actors.

Project aim

Strengthening the existing infrastructure related to the ESFRI METROFOOD-RI for the domain health and food and included in the NPRI high-priority list, focusing on the electronic component and its integration with the physical one, making it fully implemented, fully operational and sustainable in the long-run.

Finanziato dall'Unione europea NextGenerationEU
Ministero dell'Università e della Ricerca
Italiadomani PIANO NAZIONALE DI RIPRESA E RESILIENZA

METROFOOD-IT Concept



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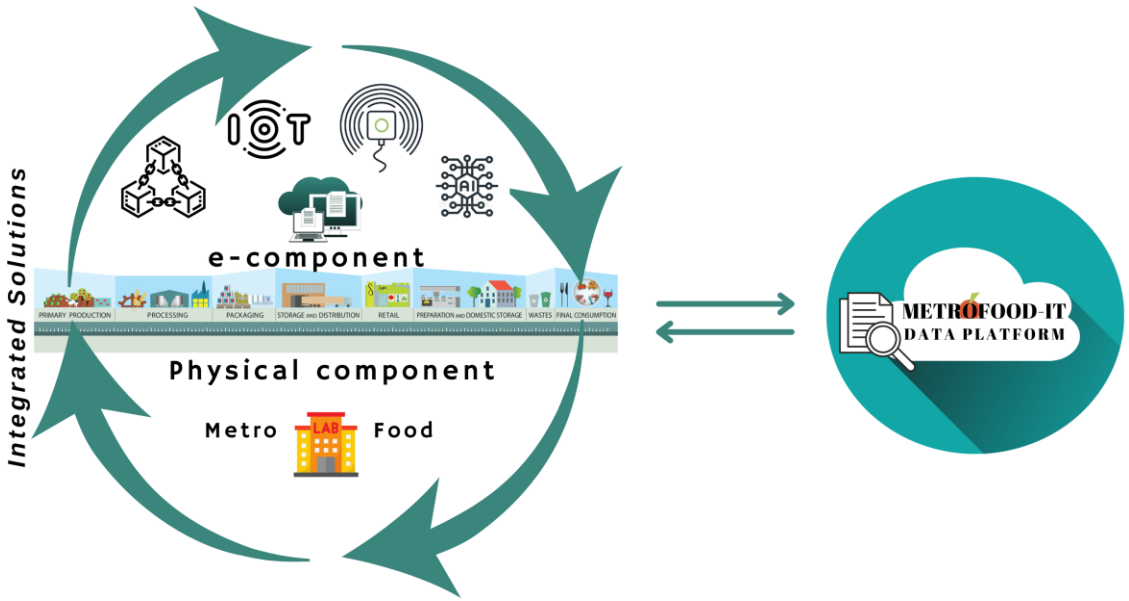
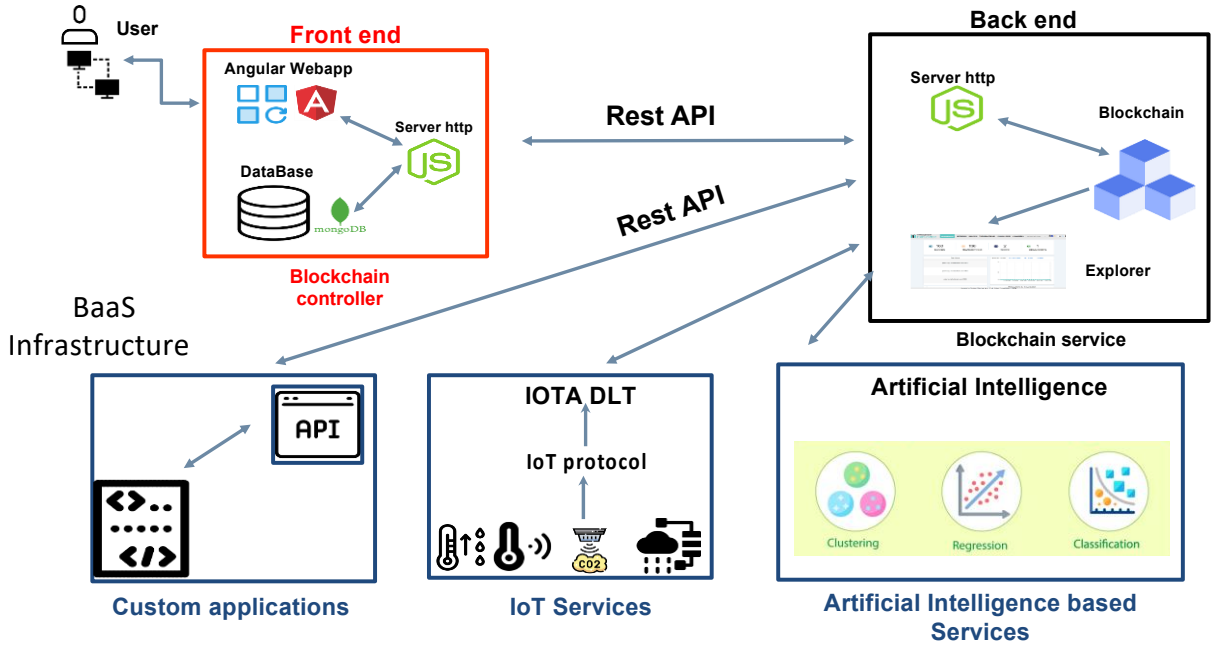
Italiadomani PIANO NAZIONALE DI RIPRESA E RESILIENZA

METROFOOD-IT

Data platform and ICT integration

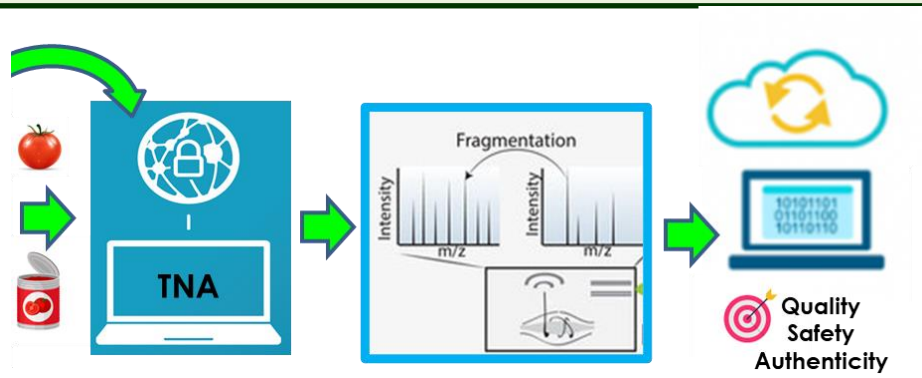




METROFOOD-IT

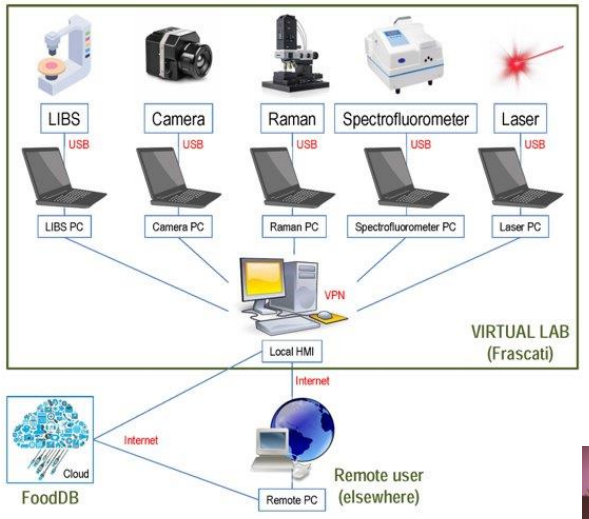
Services and Living Labs

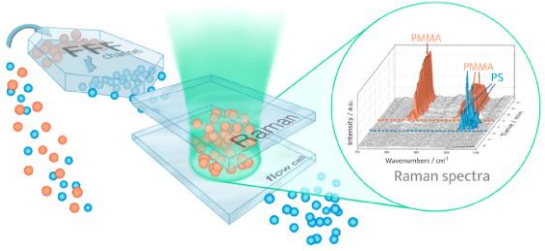
Service provision



3 calls for access - TNA & VA

- Open data of spectroscopical signatures for food frauds (remote and virtual access; 2 open calls, 10 accesses for researchers + 10 accesses for food businesses)
- Open data for authenticity and traceability (physical and virtual access; 2 open calls, 5 accesses for researchers + 5 accesses for food businesses)
- Nanoparticle characterization in food and modelling instruments (wide virtual access)

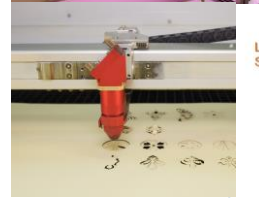


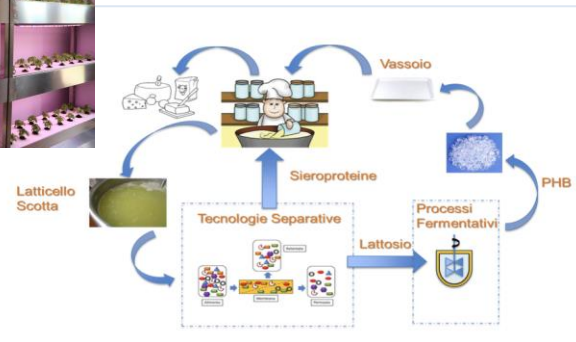


Open Innovation Hub & co-creation

2 Living Labs (LL)

- LL *Circular bioeconomy & industrial symbiosis*
- *Agrifood FabLab*





AgroServ

Sowing the seeds of research in Agroecology

Funded by
the European Union

https://www.linkedin.com/company/agroserv-eu
https://twitter.com/AgroServEU

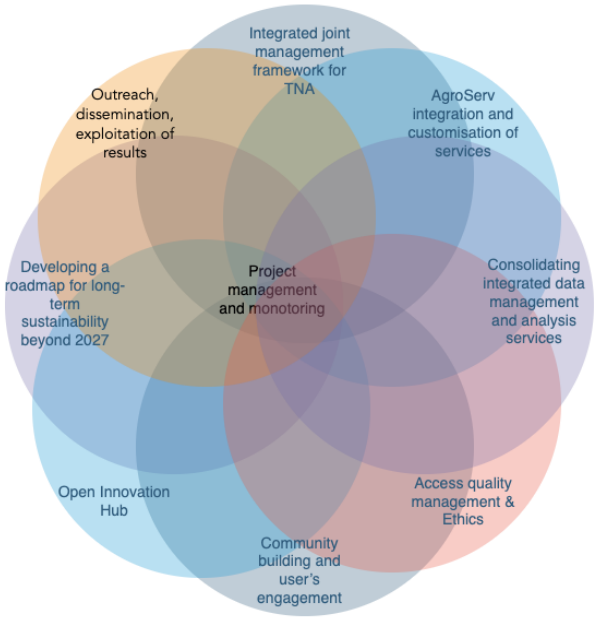
11 RIs join efforts

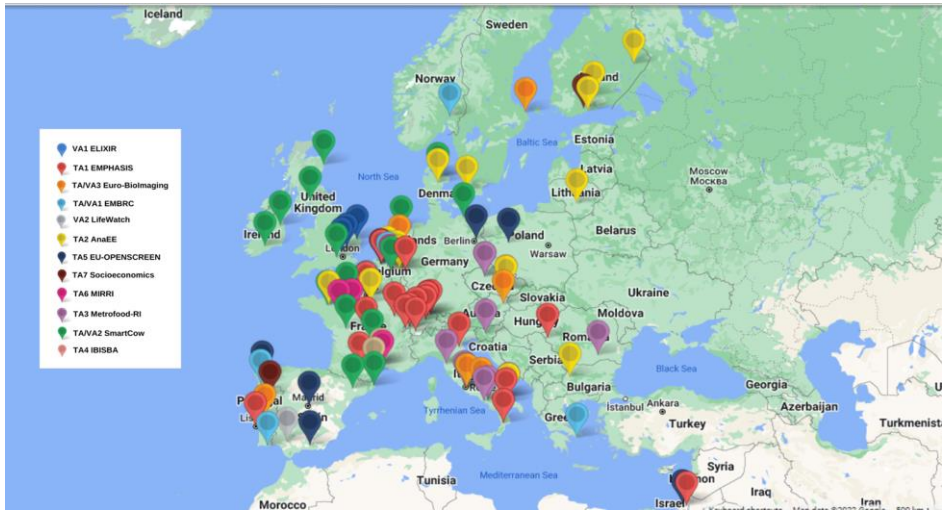
All scales

From molecule to ecosystems to society

70++ partner institutions, 143 services offered

This diversity is a source of wealth,… and a challenge





AgroServ services are covering most of EU++

One year to prepare the first call

Readiness of services

Readiness of catalogue

Explore interactions, interoperability

Prepare data delivery

Themes and/or challenges addressed for the call

- From the scientific community
- Challenge oriented (society)

Ethical aspects

Prepare evaluation of proposals

Communicating with, and training the community

LL approach and interaction with the society

AgroServ
Integrated SERvices supporting a sustainable AGROecological transition

European Research Services on Agroecology Conference

5th & 6th June 2023

Prague & Online

AgrServ

Funded by the European Union

Conference

What integrated and transdisciplinary research services to accelerate agroecological transitions?

AgroServ Webinar

European Research Services on Agroecology

May 15th 2023

Online

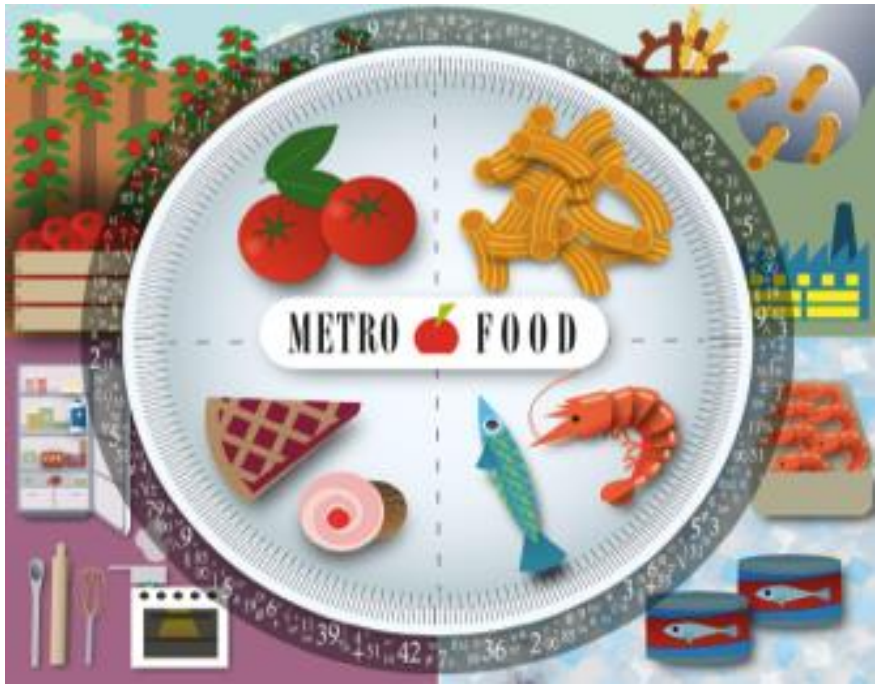
Funded by the European Union

AgroServ Webinar

Serving research for the agroecological transition.

METRO FOOD
INFRASTRUCTURE FOR PROMOTING METROLOGY IN FOOD AND NUTRITION

Thank you for your attention!



www.metrofood.eu
www.metrofood.it

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