FishEUTrust

FishEUTrust: Innovative technologies ensuring seafood authenticity, safety, and transparency throughout the supply chain

by Nives Ogrinc

Funded by the European Union

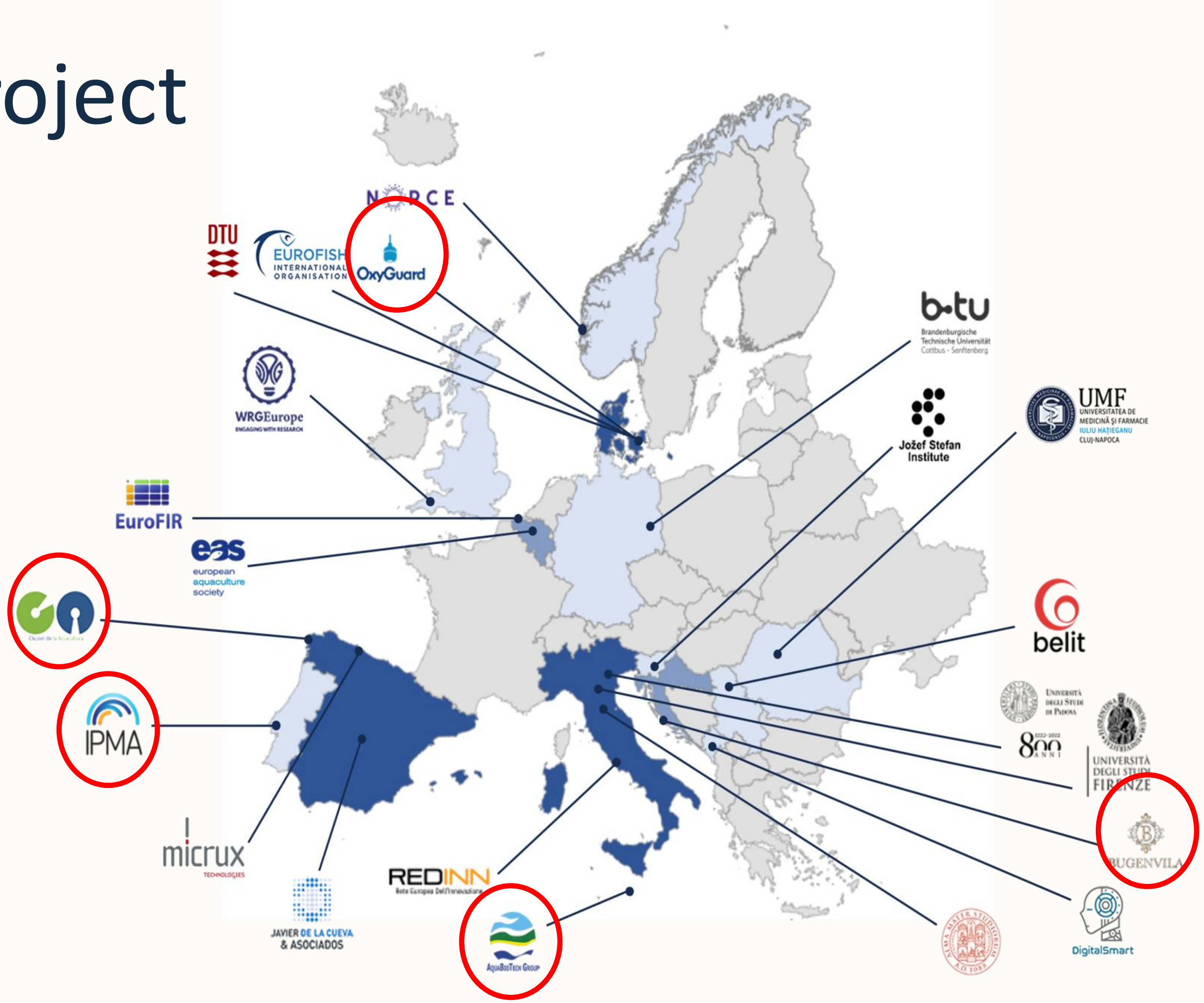
Structure and aims of the project

Overview

Call: HORIZON-CL6-2021-FARM2FORK-01-10: Sea to fork transparency and consumer engagement
Type: Innovation Action (IA)
Budget: proposed: € 5.0 M, reduced: € 4.6 M
Duration: 1.6.2022-31.5.2026

Partners

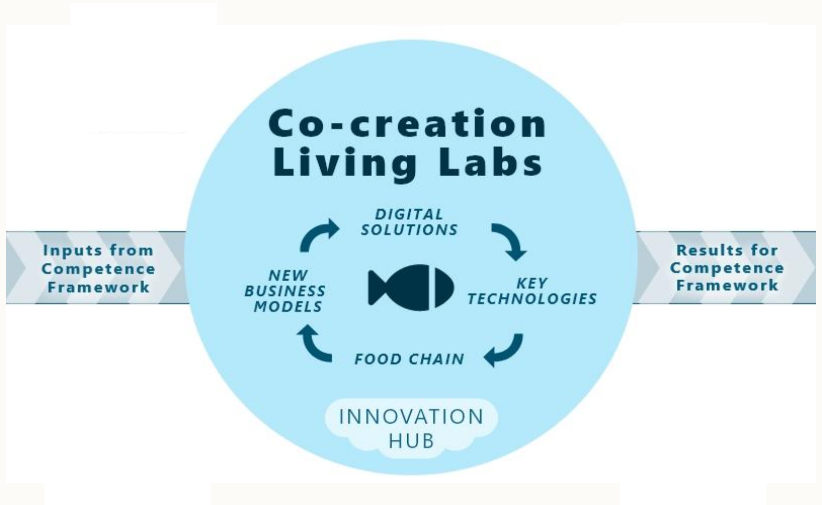
20 partners from 14 EU countries: 9 RTD, 9 SMEs, 1 association (Eurofish), 1 NP-SME (EuroFIR)
2 Associated partners: WRG, EAS



Aims

Ensure a sustainable seafood supply chain
Strengthen transparency and traceability
Support pan-European aquaculture
Promote healthy diets and responsible consumer behavior
Advance the blue economy

Strategy and concept



Co-creation Living Labs

Testing in real life environment: 5 LLs in Mediterranean, Atlantic, N Sea

Technological innovations

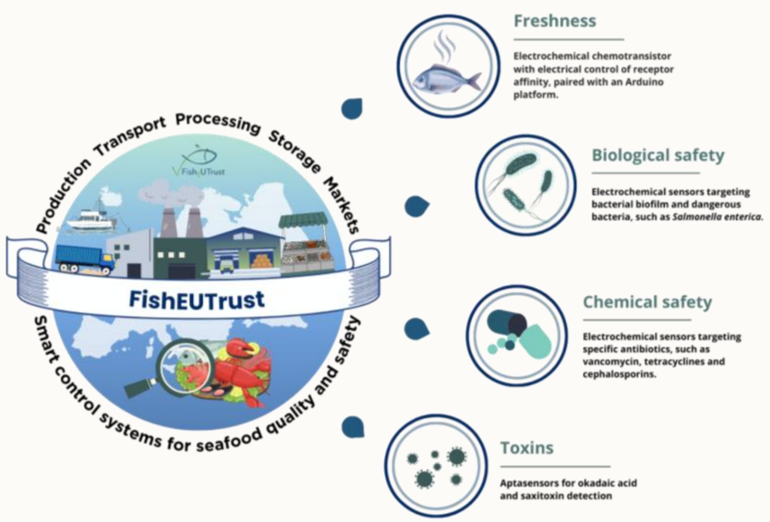
Quality, safety, traceability: physical traceability, sensors, digital solutions

Social needs

Behaviour, engagement of consumers

Management

Exploitation, development of the business model



Technology Overview

Physical Testing

Scientific methods to verify food authenticity and safety.

Food Sensing

Advanced sensors detecting contaminants and measuring freshness.

Internet of Things (IoT)

Connected devices monitoring seafood throughout the supply chain.

Blockchain

Secure, transparent record-keeping for complete traceability.

Physical Testing Methods

Scientific Verification

Physical testing verifies both authenticity and traceability of seafood products

Methods include metagenomics, advanced DNA barcoding and stable isotope approach

Tests can identify species, origin, and type of production (wild vs. aquaculture)

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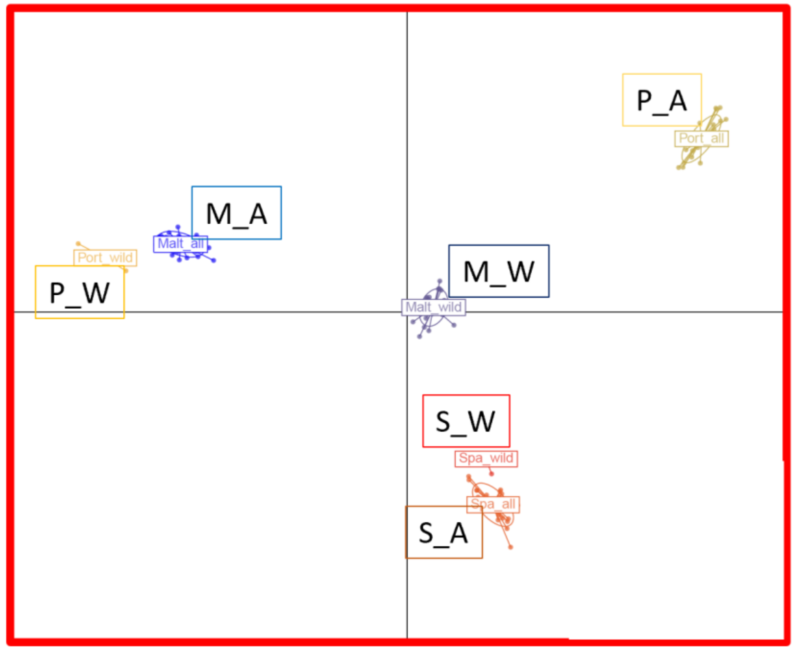
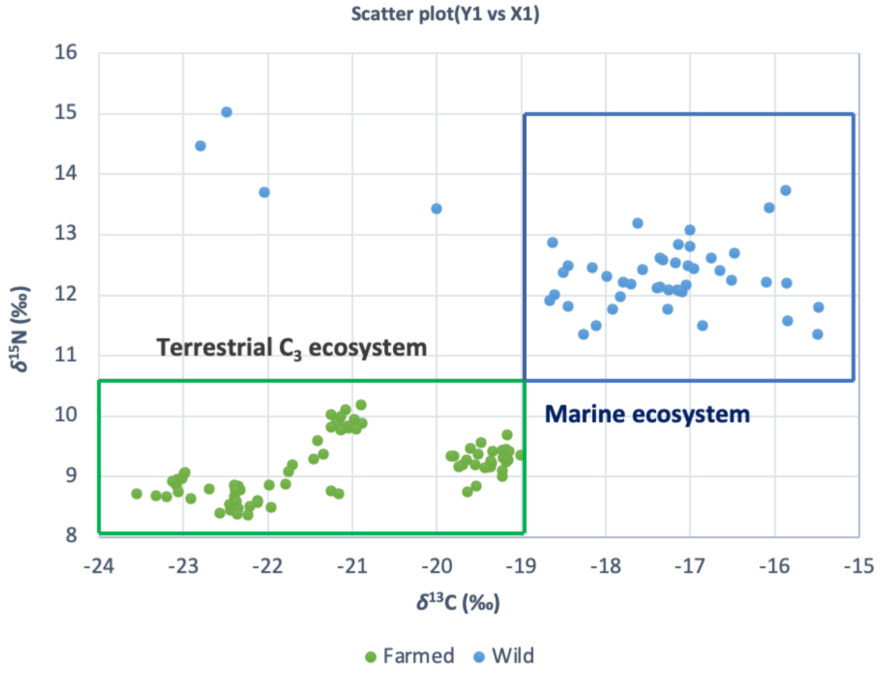
Sample collection



DNA barcoding

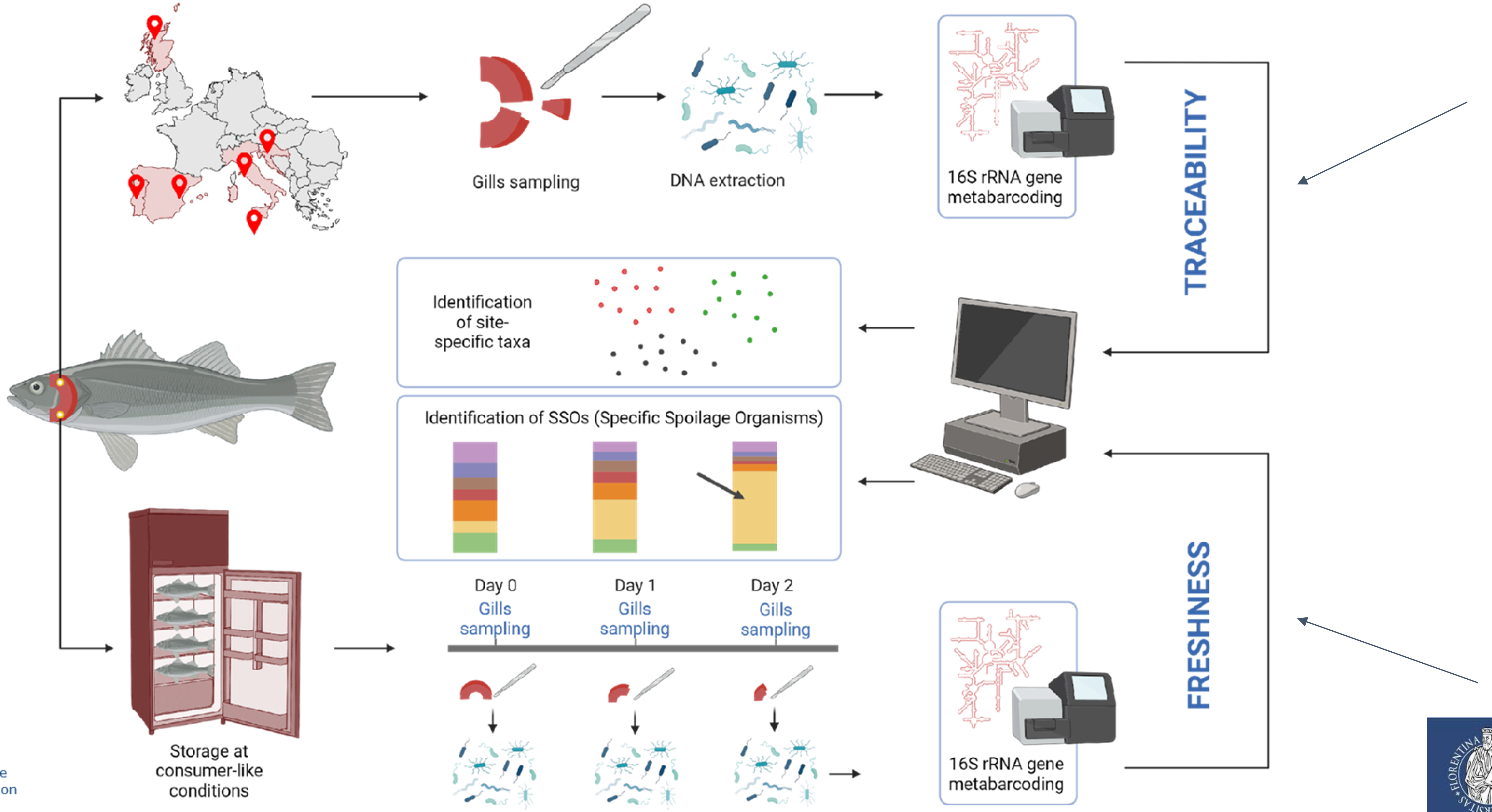
DPCA on 161 sea bream sample based on 27,913 common SNPs



Stable isotope approach

Microbiological traceability tools using target and non-target metagenomics

Seafood quality, safety, and traceability



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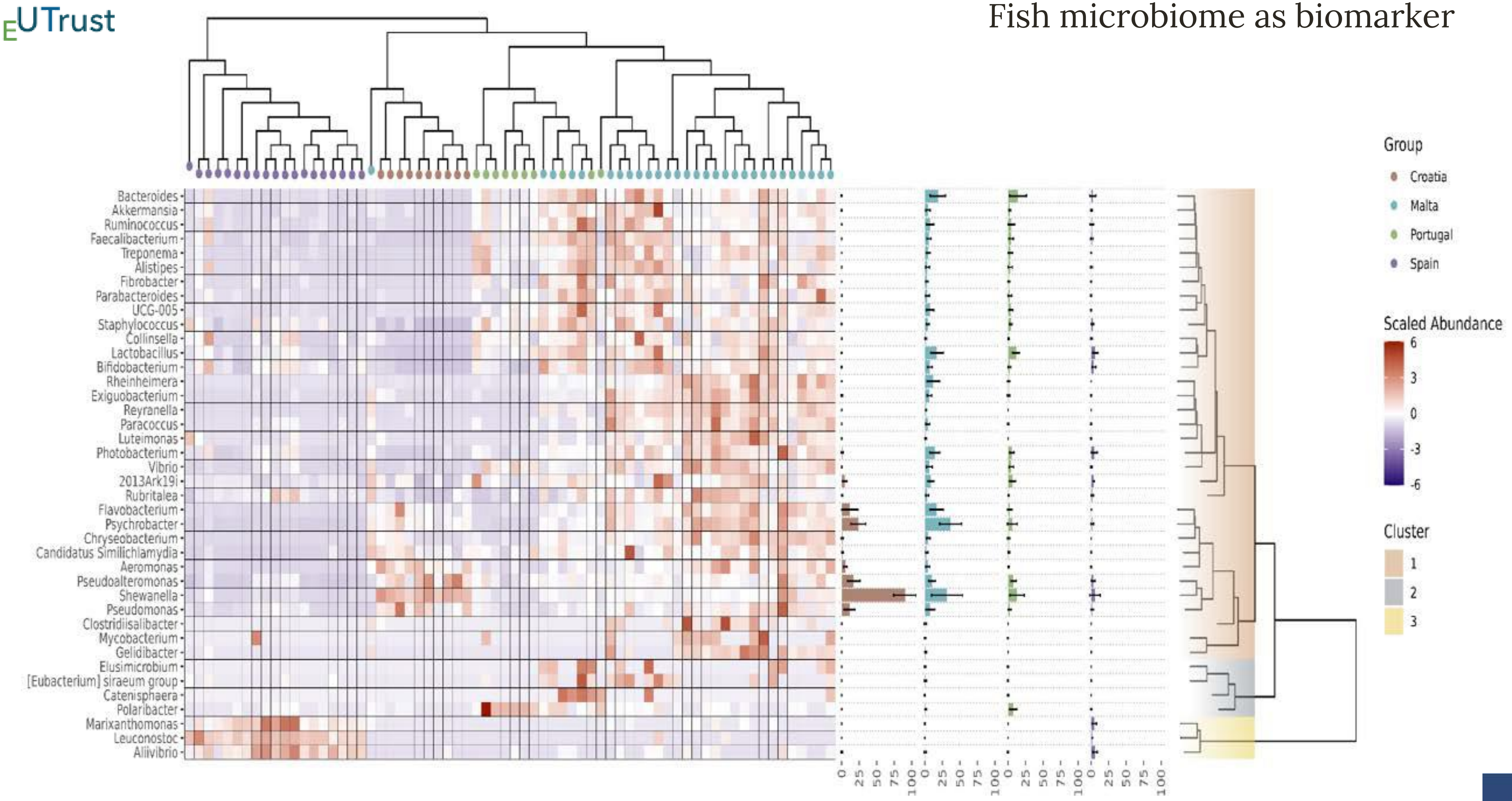
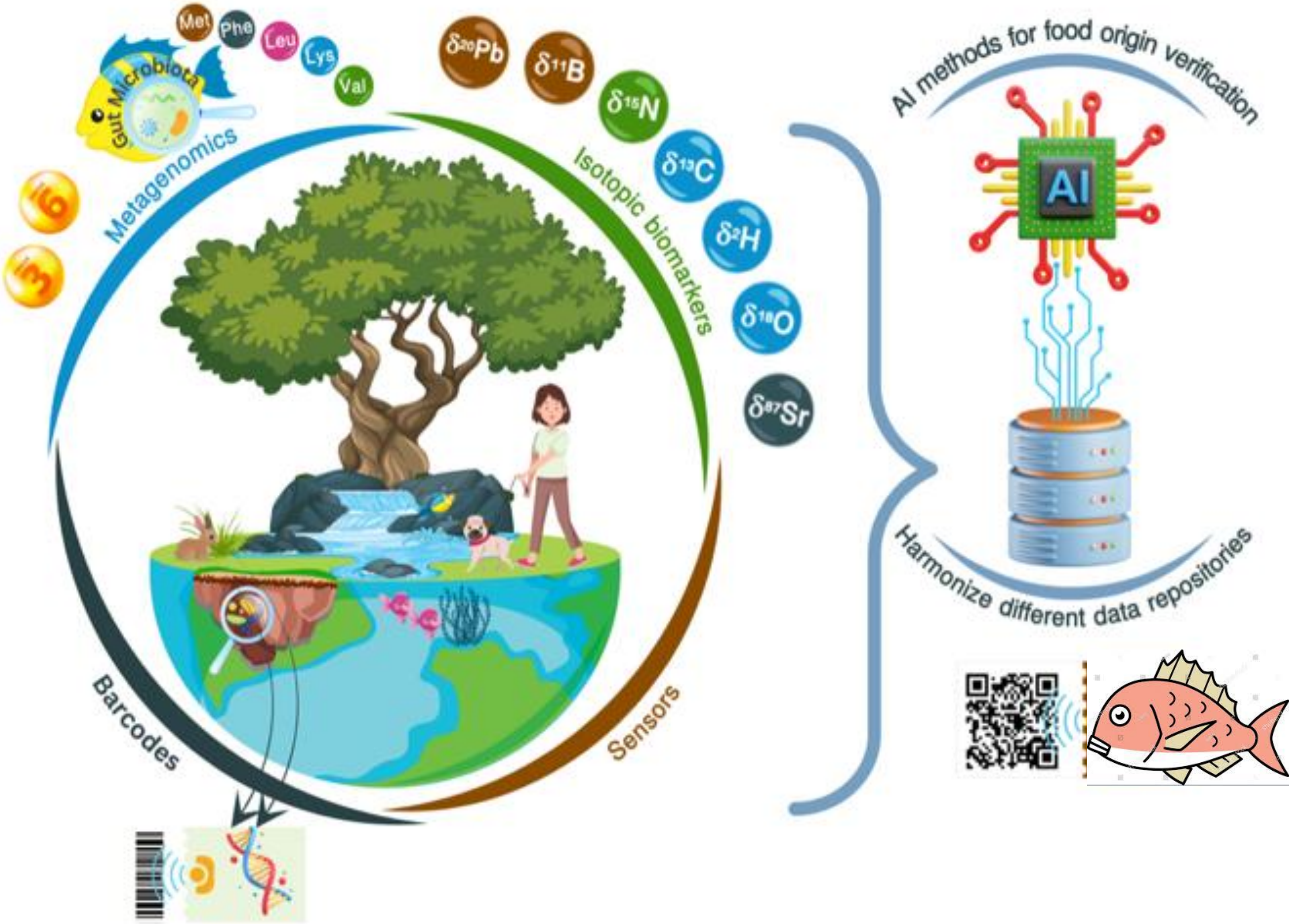
Fish microbiome as biomarker

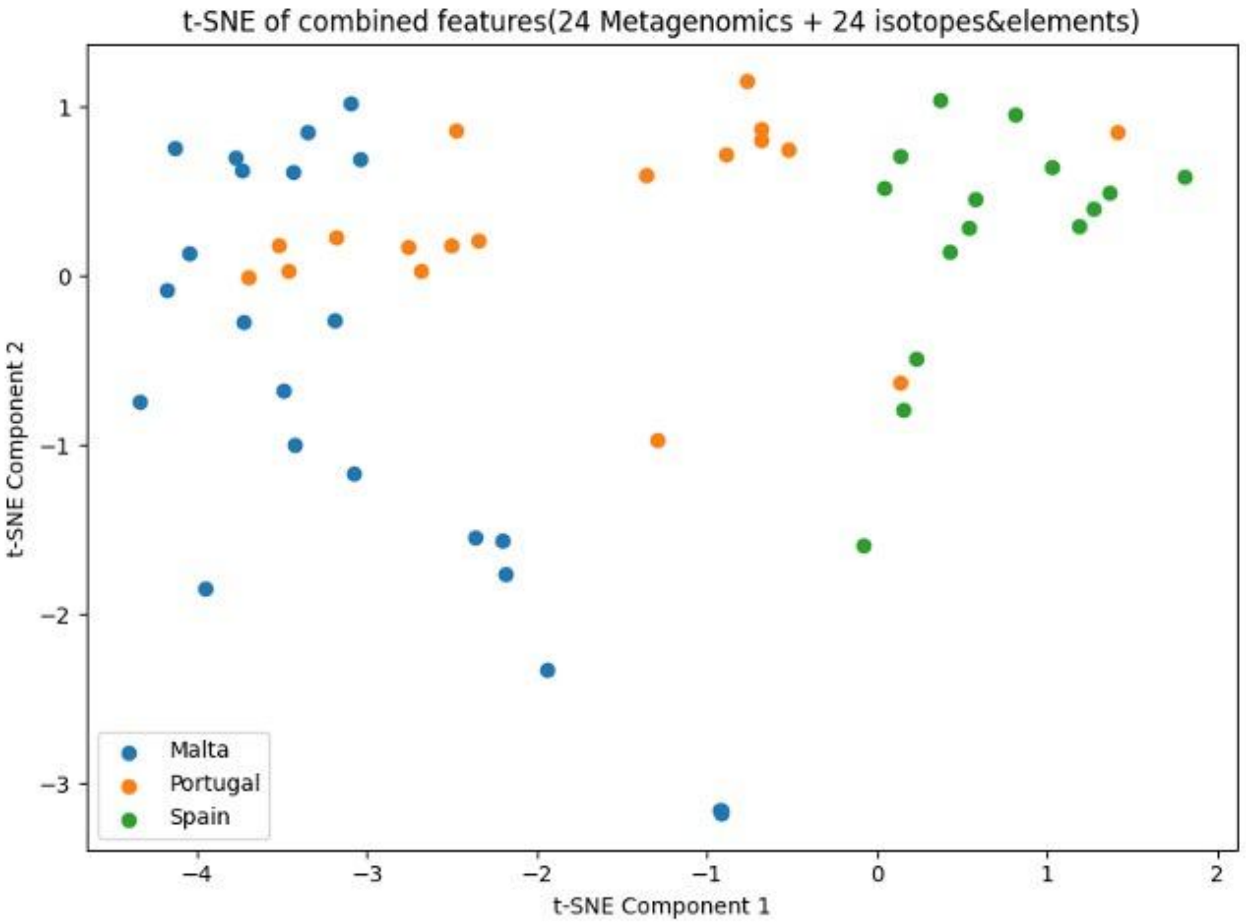




Food authenticity and traceability concept

Region of production

Data	Decision Tree	Random Forest
Isotopes + elements	92.8% (Sd. 4.5%)	97.0% (Sd. 5.7%)
Metagenomics data	61.7 % (Sd. 17.1%)	73.0% (Sd. 6.6%)
Combined data	95.6 % (Sd. 5.8)	94.0% (Sd. 9.0%)



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Smart Control Systems

Continuous Monitoring

Automated systems track quality parameters throughout processing.

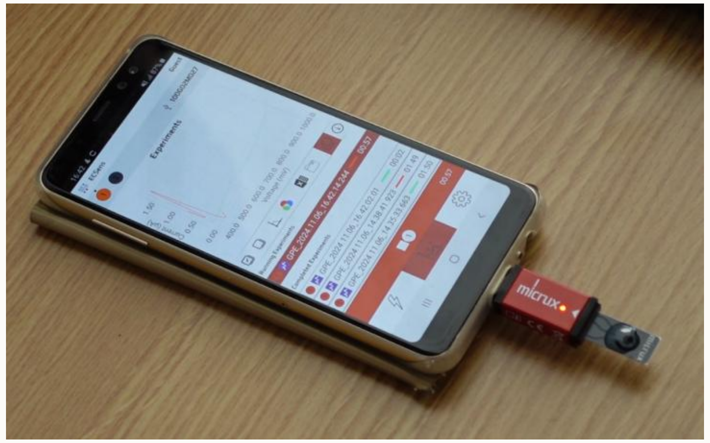
Reduce waste

Reduces food waste by accurately determining shelf life.

Safety Assurance

Immediate alerts prevent compromised products from reaching consumers.

Advanced Sensing Technologies



Sensors for detection of pathogenic bacteria or antibiotics

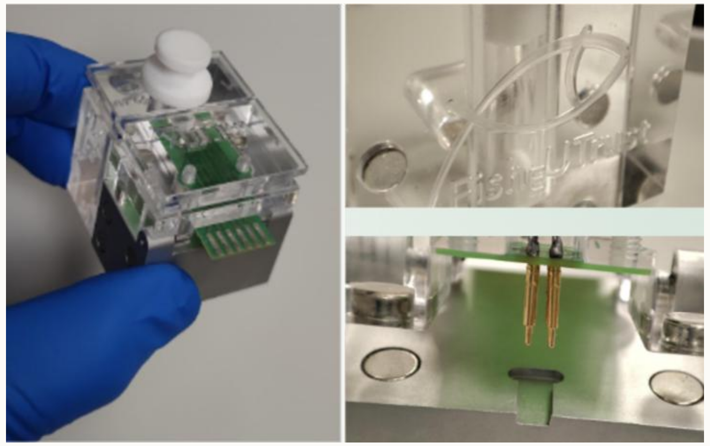
Electrochemical sensors targeting bacterial biofilms and dangerous bacteria such *as Salmonella enterica*
Electrochemical sensors targeting specific antibiotics, such as vancomycin, tetracyclines and cephalosporins

A sensor for detection of marine toxins

Aptasensors for okadaic acid and saxitoxin detection

R&I for a Competitive Green Transition conference

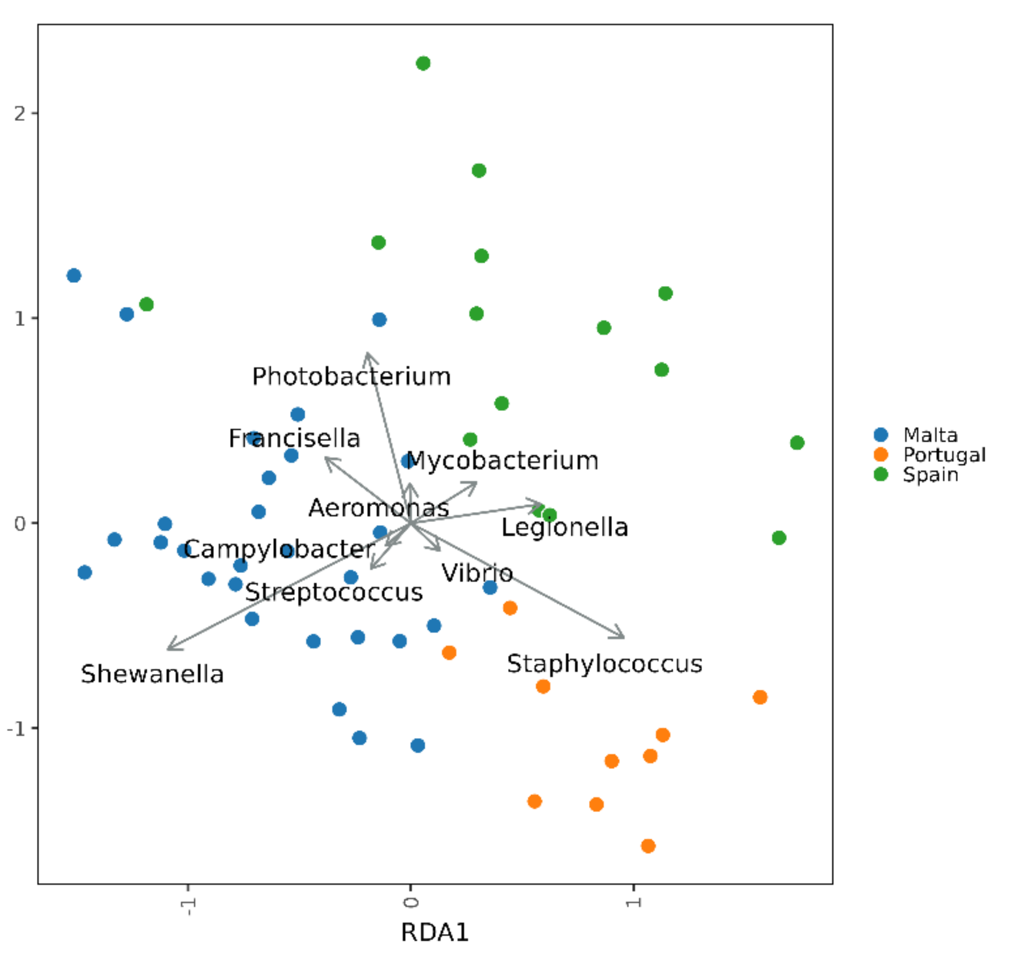
https://fisheutrust.org/innovations.html



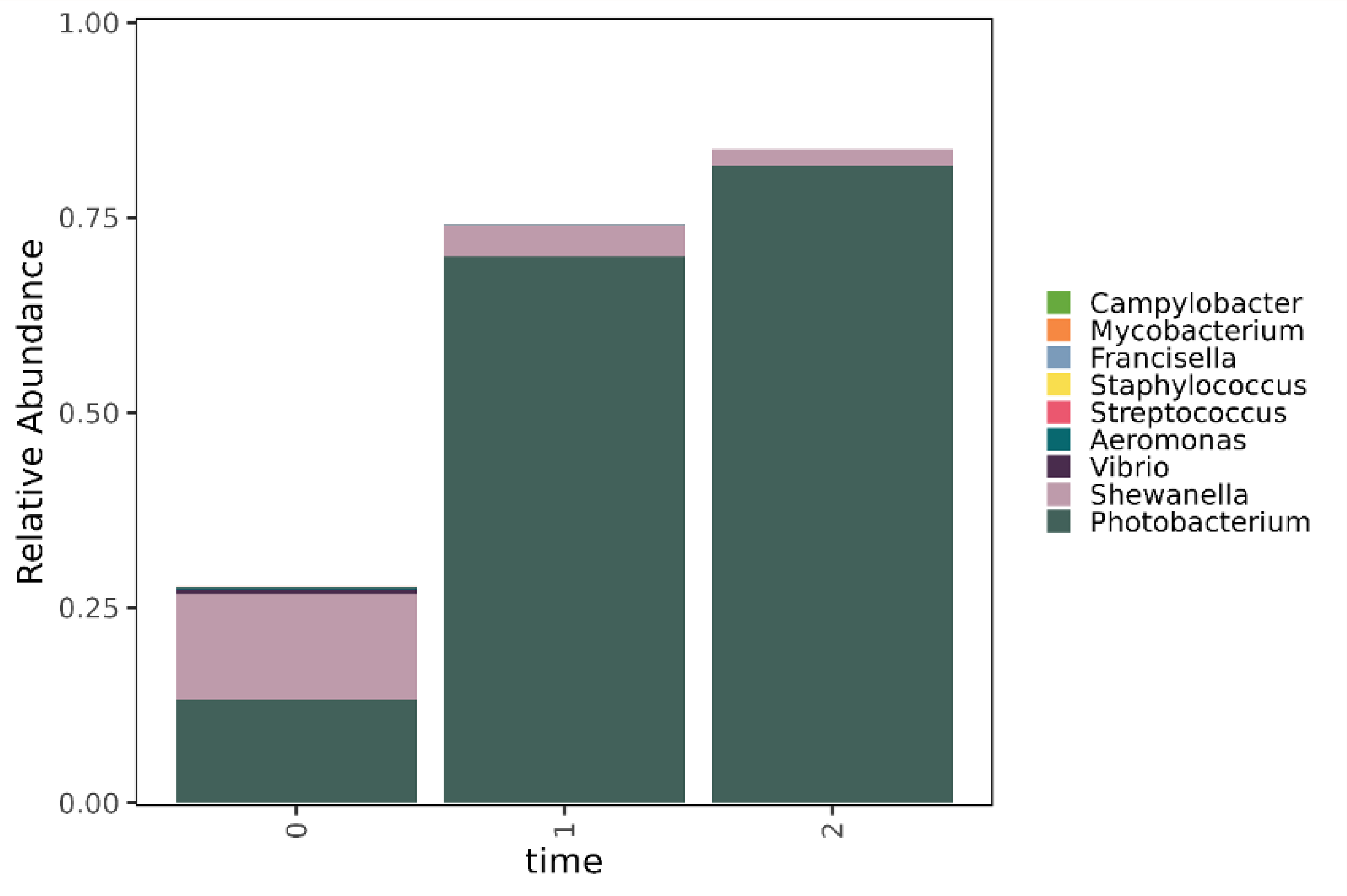
Sensor for freshness

An integrated electrochemical chemotransistor, which includes a conducting polymer as the chemosensitive material

Freshness, Safety vs Metagenomic data

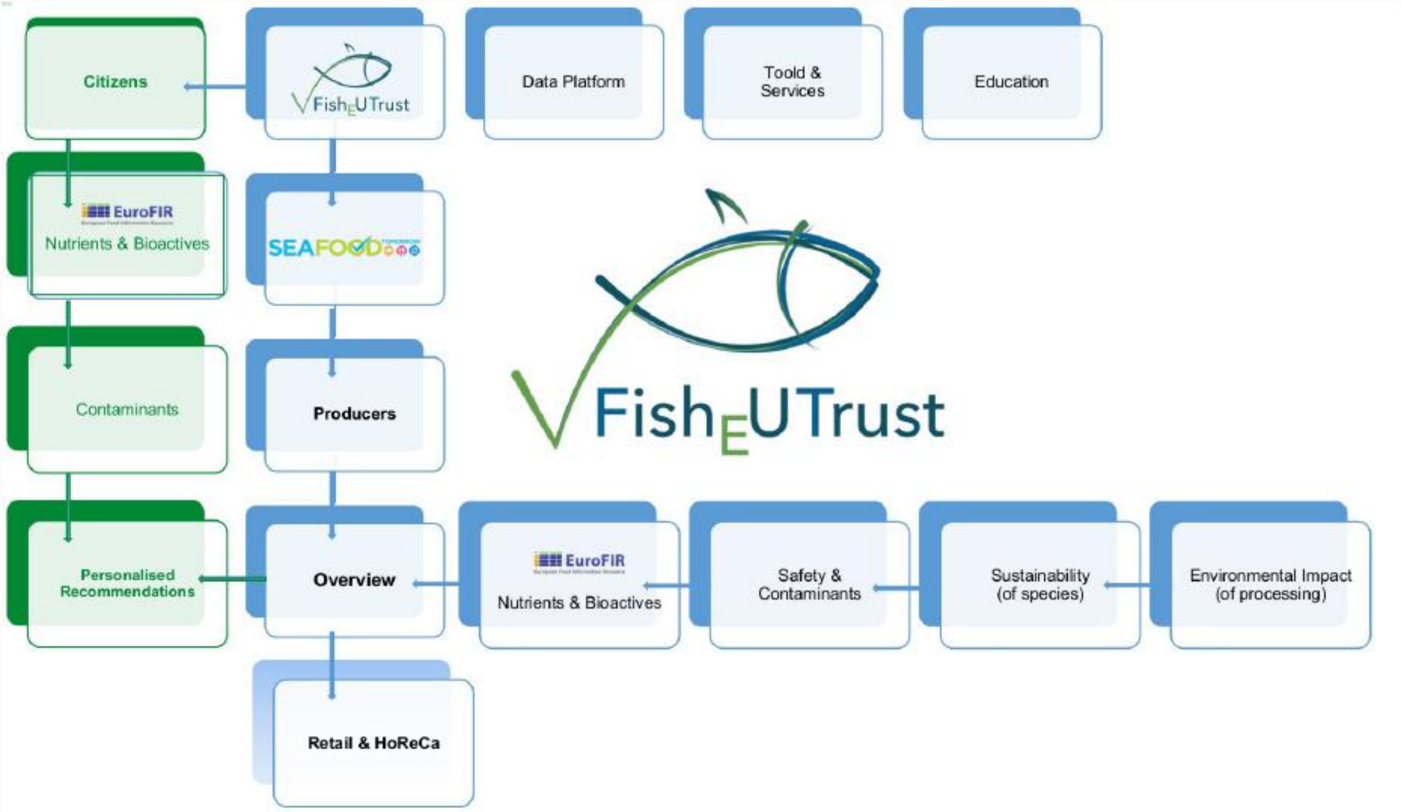


Relative abundance of ten potentially pathogenic or spoilage related bacterial genera structures microbial communities in seabream samples from Malta, Portugal and Spain



Relative abundances of ten bacterial genera with known pathogenic or spoilage potential in seabass samples

Digital Solutions



Benchmark Tool

SEAFOOD TOMORROW

IoT system (Cobália, MonteNegro)

Hardware devices linked to the internet to assist in data gathering

Prototyping Product Passport and QR code based smart tag

Blockchain solution, and Software as a Service

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EuroFIR European Food Information Resource · OxyGuard · DigitalSmart · belit · Jožef Stefan Institute

IoT Systems in Action

1

Cobália ‘Industry 4.0 navigation’

Connected sensors throughout seafood supply chain.

Real-time monitoring of water quality.

2

Montenegro Fish Farming

IoT systems monitoring water quality and feeding.

GPS location and cold storage monitoring in trucks.

3

Data Integration

Information flows seamlessly between production and distribution.

Complete visibility from farm to consumer.

Understanding Consumer Perspectives

Key focus areas include understanding consumer behavior, identifying trust barriers, and developing targeted interventions that drive adoption of traceability technologies.

Physical face-to-face

Education material, testing, cooking classes, partnership with chefs, youth engagement

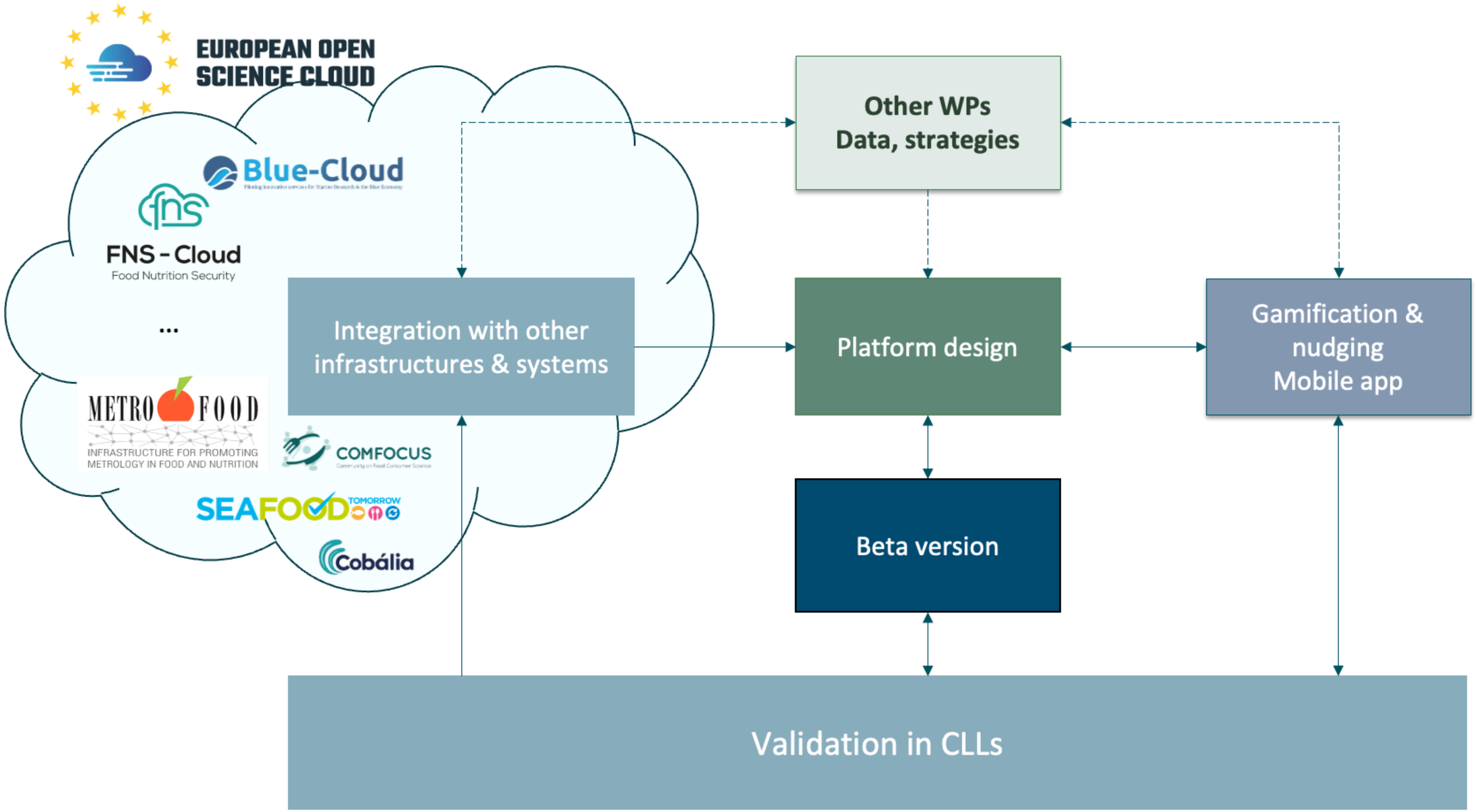
Digital Solutions:

FishEUTrust platform and game

VR Experiences

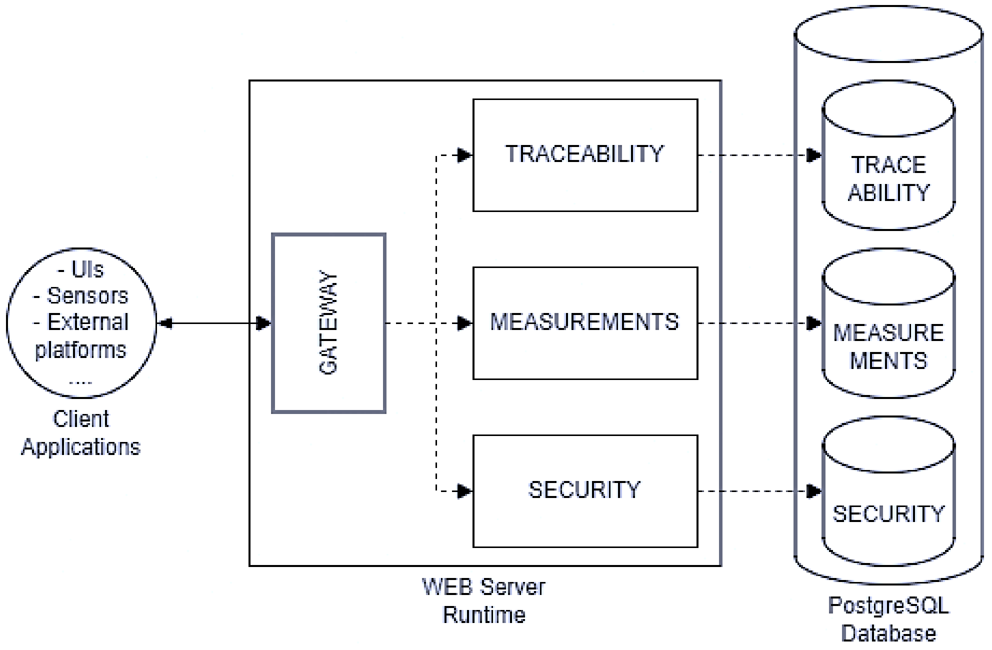
Immersive virtual reality tours in the supermarket

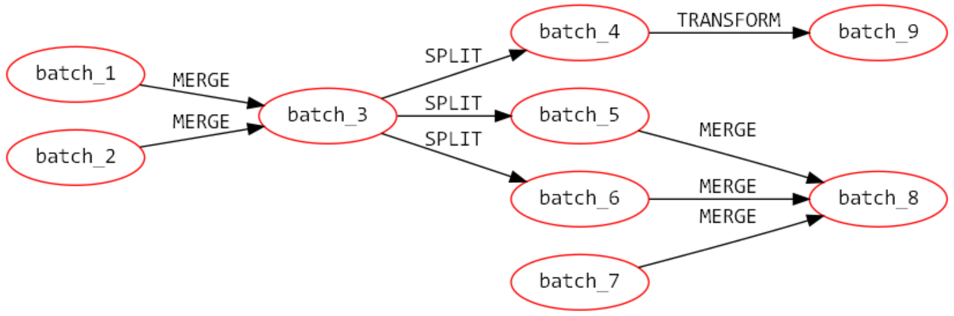
FishEUTrust Platform



Design a platform to support integration of technologies, digital solutions for supporting consumer empowerment and data and information sharing

Product Passport and QR code based smart tag





Traceability throughout batches

A blockchain will be used for the batch's digital passport, containing essential data – still under discussion

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Thank you for your attention!

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