



# Project Overview

**THEROS: An integrated toolbox for improved verification and prevention of adulterations and non-compliances in organic and geographical indications food supply chain**

**Workshop:**

**Fraud detection and prevention in the fish value chain**

**THEROS** 

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# THEROS Key Facts



- 🌿 **Project Title:** An integrated toolbox for improved verification and prevention of adulterations and non-compliances in organic and geographical indications food supply chain
- 🌿 **Call identifier:** HORIZON-CL6-2022-FARM2FORK-01-04
- 🌿 **Topic:** “Innovative solutions to prevent adulteration of food bearing quality labels: focus on organic food and geographical indications”
- 🌿 **Duration:** 01.01.2023 - 31.12.2025 (36 months)
- 🌿 **Funding scheme:** IA – Innovation Action
- 🌿 **EU contribution:** EUR 3,999,961.00
- 🌿 **Coordinated by:** Institute of Communication and Computer Systems (ICCS), Greece



# THEROS Consortium

- **4 Research Institutes & Technology Organizations** (ICCS, AUTH, JSI, CERTH)
- **4 Control and Certification Bodies / Authorities** (ELGO, OCS, KIWA, BIO-HELLAS)
- **5 Large Enterprises & SMEs** (NTT DATA, SINERGISE, EBOS, SEABILITY, WRLS)
- **1 Regulatory Council for a DPO** (MEXILLON)
- **2 Retailers / Wholesalers** (UNIVER, SUMAVA)
- **1 Cooperative and Producer Association** (BIO-NET)



6 Participating Countries



17 Partners



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# Motivation



## SUSTAINABILITY

Promote sustainable farming to create resilient food systems that protect the integrity of organic products and benefit local farmers.

## COMBATING FOOD FRAUD

Prevent adulteration and fraud in high-value organic and GI foods to protect consumer trust and product integrity.

## TECHNOLOGICAL ADVANCEMENTS

Use digital technologies like blockchain and digital passports to improve traceability, integrity, and security in the food supply chain.

## CLIMATE GOALS

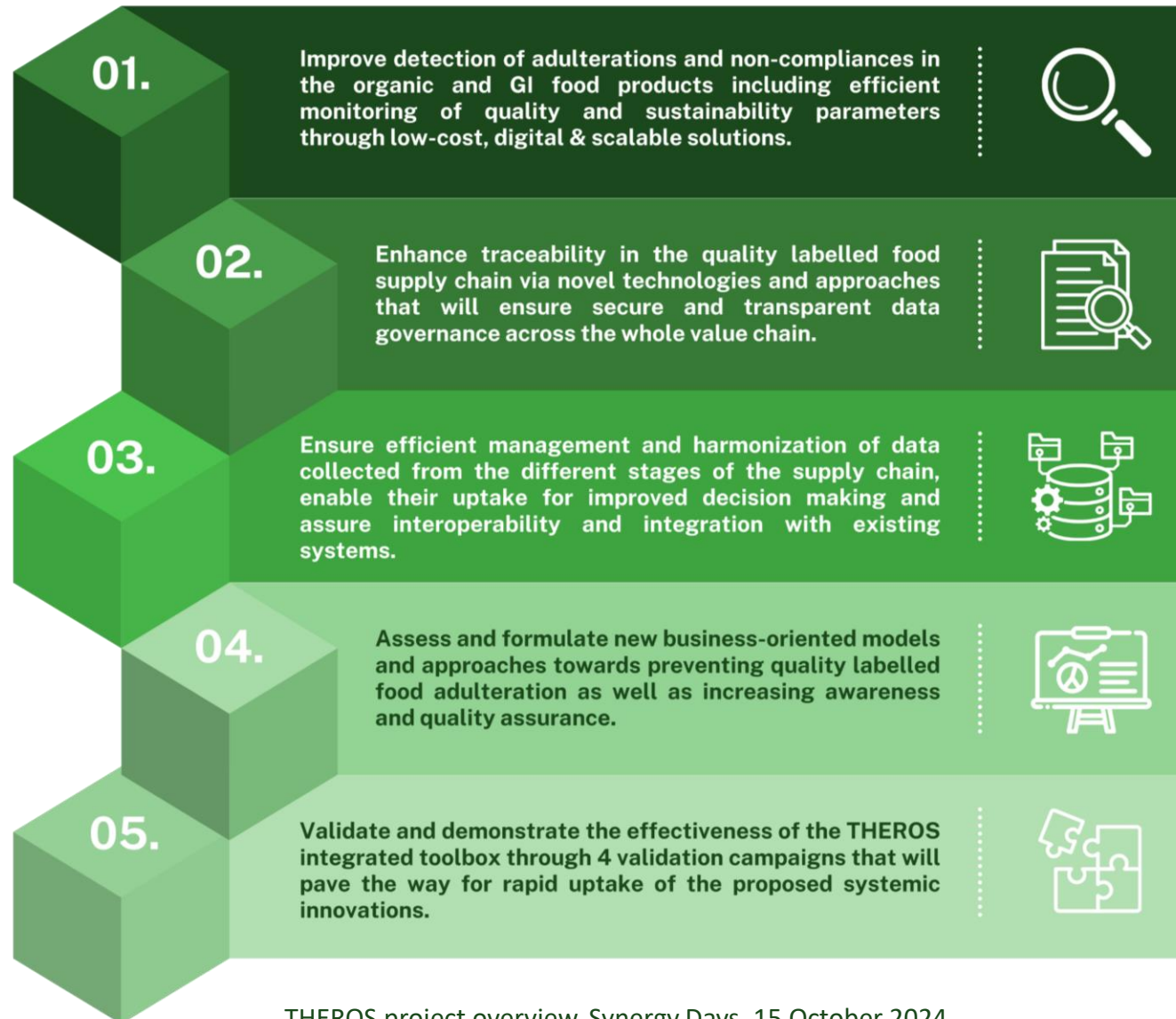
Aim for a climate-neutral Europe by 2050 through sustainable food systems and eco-friendly farming.

## ECONOMIC AND SOCIAL BENEFITS

Support fair economic returns for local farmers, contribute to economic growth, and ensure safe, healthy, high-quality food for consumers.

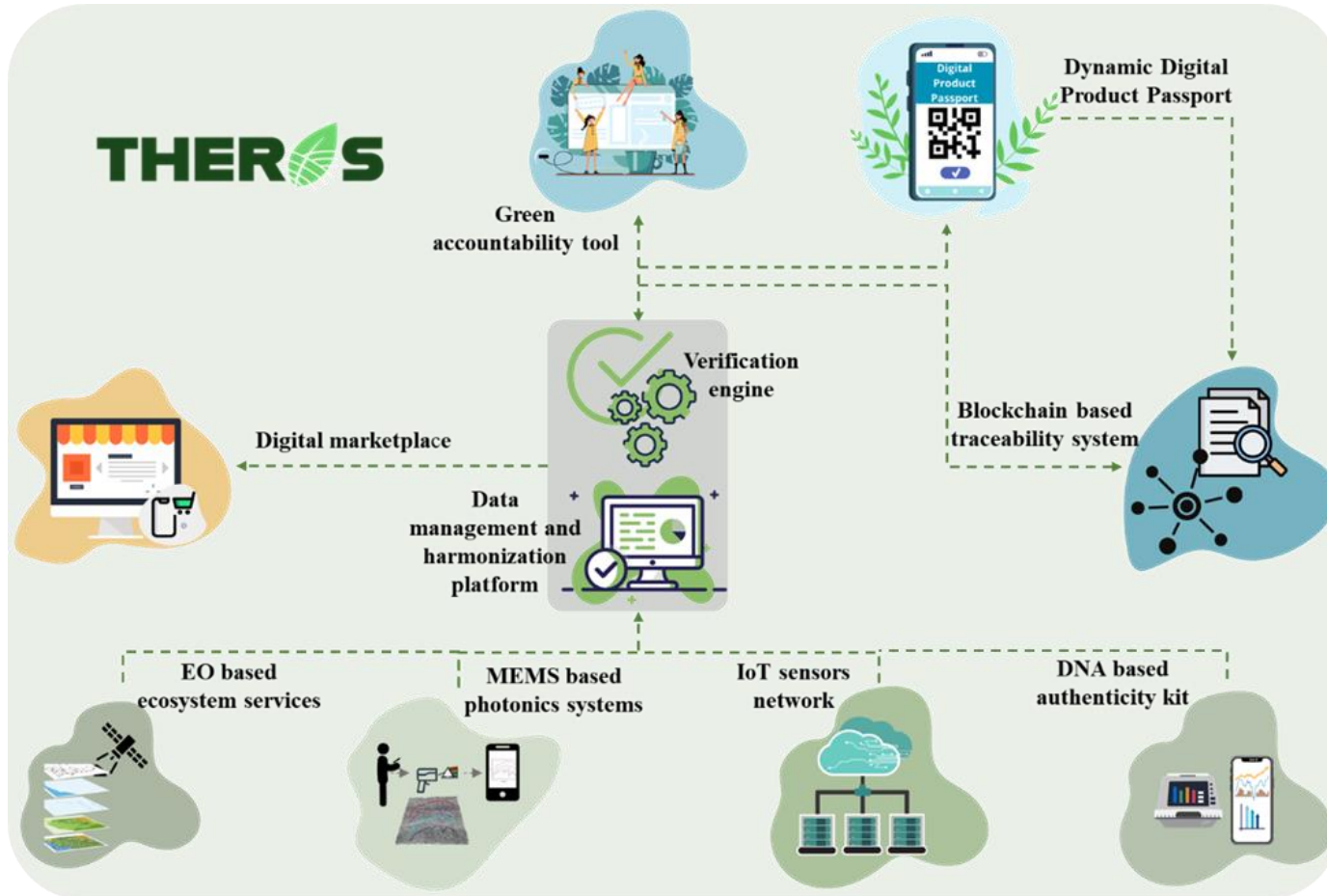
## POLICY SUPPORT

Align with European Commission initiatives to enhance transparency and restore consumer confidence in organic trade.



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# THEROS Vision & Concept



THEROS aims to implement an integrated toolbox being capable to modernize the process of verifying organic and geographical indications food products and preventing adulterations and non-compliances, while demonstrating enhanced traceability, security and transparency in the supply chain, through the use of various technologies and innovations

that leverage *Earth Observation, photonics, internet of things (IoT), DNA metabarcoding, blockchain, digital interfaces and product passport, advance analytics, machine learning, artificial intelligence and business models.*

At the same time, efficient mechanisms will be employed in order to ensure interoperability with existing control systems, as well as improved accessibility and sharing of data through harmonized and standardized means, whilst also demonstrating their uptake by relevant stakeholders for improved decision-making.



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# THEROS Pilot Demonstrations



## Pilot 1: Serbia



The pilot demonstration will focus on the employment of THEROS toolbox components in order to facilitate efficient large-scale monitoring of organic food assets.

## Pilot 2: Greece



The pilot demonstration will focus on the verification of organic production practices.

## Pilot 3: Czech Republic



The pilot demonstration will focus on the design and validation of an extended innovative business model aimed primarily at supporting the availability of organic food.

## Pilot 4: Spain



This pilot demonstration will define and engage a group of supply chain participants, aiming to cover 100% of the value chain, including initial harvesting, aggregation, transformation, shipping, packaging and selling events.

### Pilot Scope

### Use of THEROS innovations

EO based ecosystem services, MEMS based photonics systems, Green accountability tool, Dynamic Digital Product Passport, Blockchain based traceability system, Verification engine, and Data management and harmonization platform

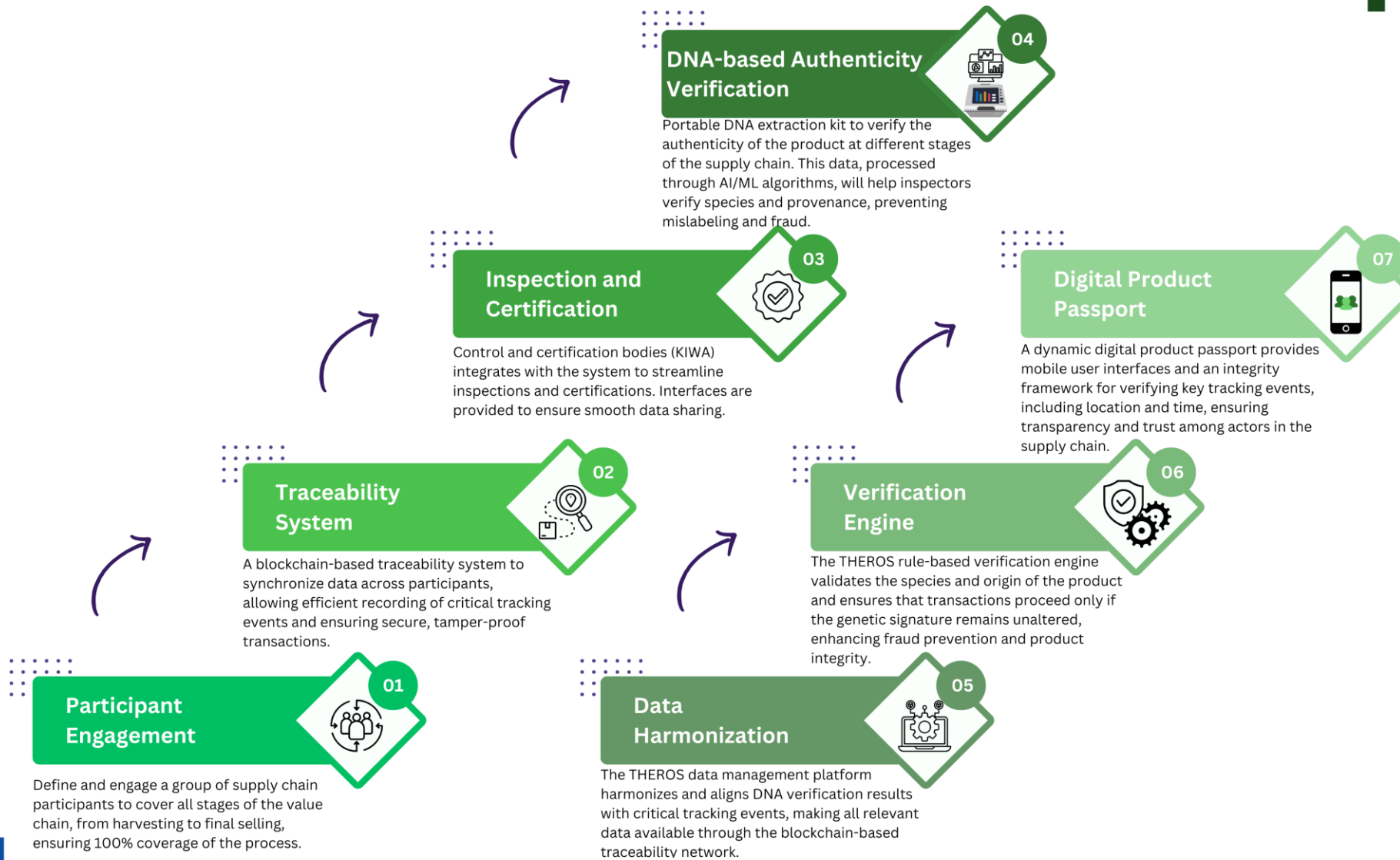
IoT sensors network, Blockchain based traceability system, Verification engine, Digital marketplace, and Data management and harmonization platform

DNA based authenticity kit, Dynamic Digital Product Passport, Blockchain based traceability system, Verification engine, and Data management and harmonization platform



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# THEROS Spanish Case Study

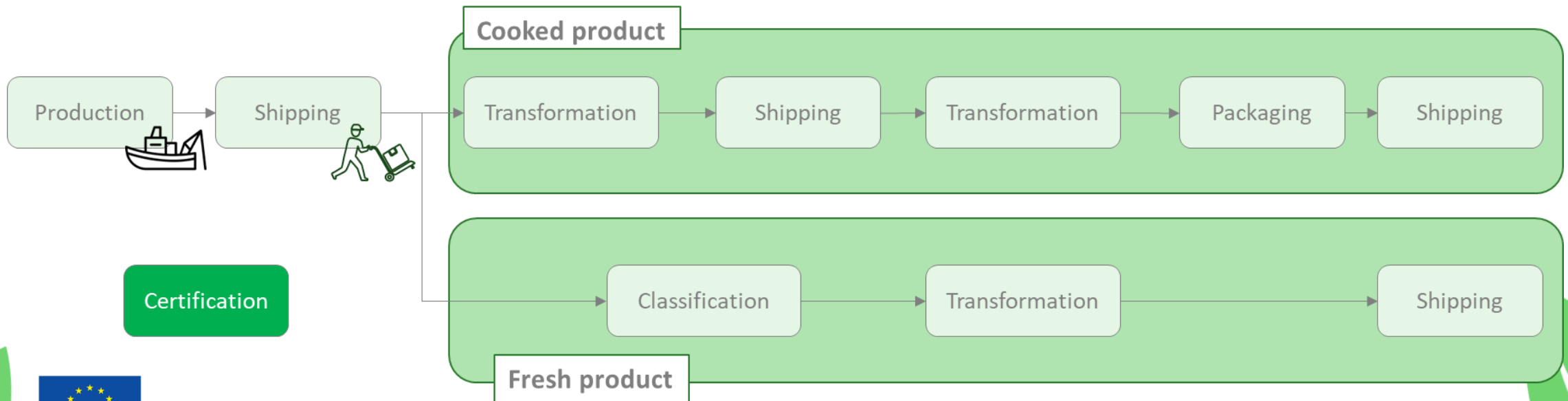
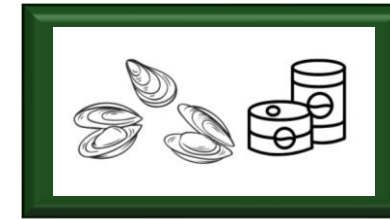




# THEROS Spanish Case Study



From a total of 3,387 rafts distributed in 5 production estuaries (rías), **2,083** are registered in the PDO.



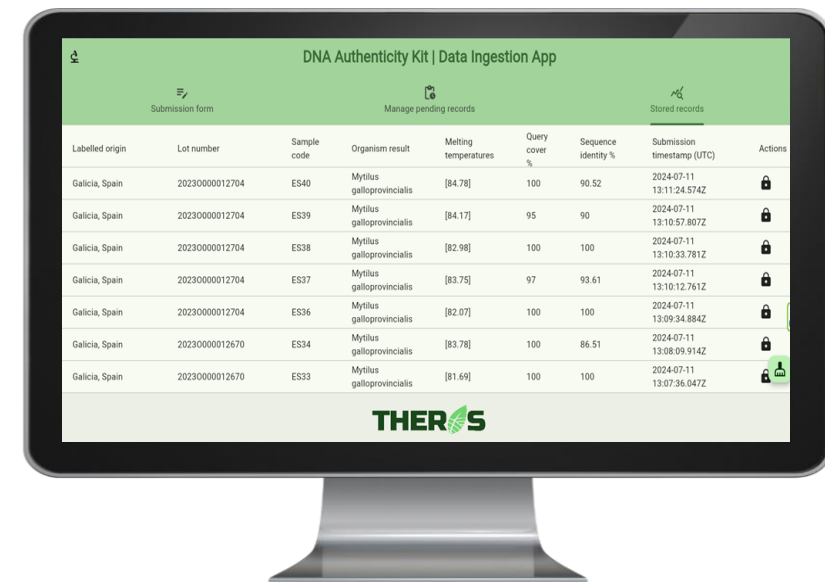
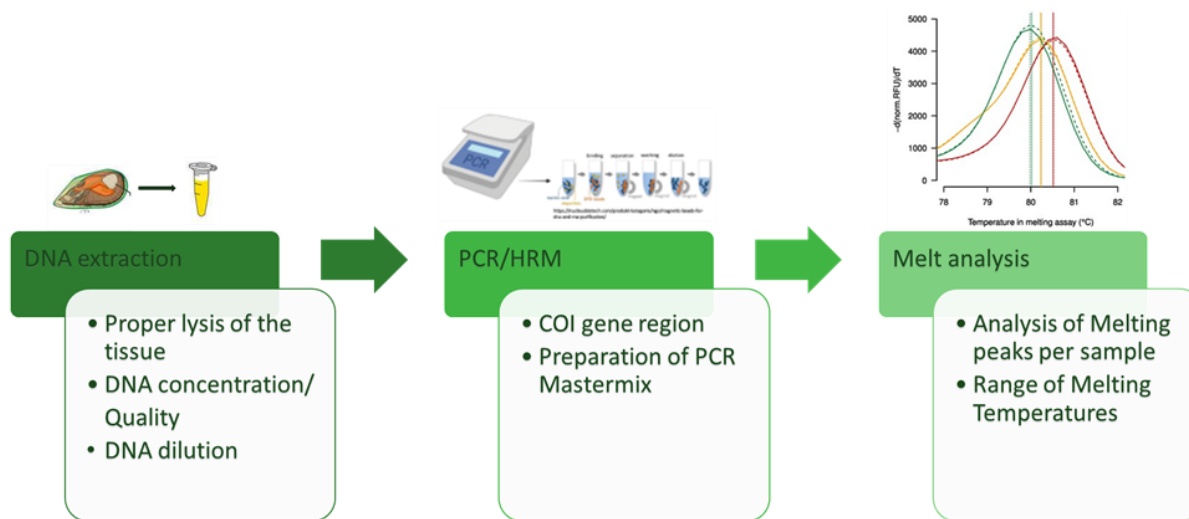
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# THEROS Spanish Case Study



- In the Spanish pilot the kit was used to analyze mussels, using DNA barcoding regions such as COI and 16S to ensure the authenticity of the products.
- Machine learning models were created to predict the origin of mussels based on DNA sequences and melting temperatures, significantly enhancing the detection of mislabeling and adulteration.
- The kit significantly enhances the detection of mislabeling and adulteration, providing a robust tool for stakeholders in the food sector, including certification authorities.



# Collaborative Edge & Synergies in Action

## Knowledge exchange & Policy contributions



🌿 **Legislation** - related regulations

🌿 **Standardization** aspects

🌿 **Governance & Interoperability**

## Technical fertilization



🌿 **Exchanging information in technical level on similar technologies** e.g. DNA meta-barcoding (FishEUTrust & WATSON), Blockchain traceability (WATSON)





[www.theros-project.eu](http://www.theros-project.eu)



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# THEROS

Thank you for your attention!

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Funded by the  
European Union

This project has received funding under grant agreement No 101083579. It is funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Executive Agency (REA). Neither the European Union nor the granting authority can be held responsible for them.