PROJECT REPORT

WASTELESS

WASTE QUANTIFICATION SOLUTIONS TO LIMIT ENVIRONMENTAL STRESS

WORKABLE IDEAS & INITIATIVES
for a SUSTAINABLE ECONOMY

WASTELESS

WASTE QUANTIFICATION SOLUTIONS

TO LIMIT ENVIRONMENTAL STRESS

THE PROJECT CHALLENGE:

The EU food system currently generates an estimated **88 million tonnes of waste annually**, representing not only a massive environmental drain but a financial loss of approximately **€143 billion**. Despite high-level policy targets, the path to a truly circular economy is obstructed by a "data fragmentation" crisis. Existing Food Loss and Waste (FLW) metrics are often incomparable across Member States due to inconsistent monitoring methodologies and a lack of transparency in reporting. Without a unified, high-resolution quantification system, the transition toward the EU Green Deal and Farm-to-Fork targets remains an administrative and industrial impossibility.

OUR CONTRIBUTION:

As the **Technical-Legal Mediator** within a 29-partner consortium, WIISE (FARE) designed the normative architecture required to synchronize commercial logistics with official EU statistical nomenclatures (NACE/CPA codes). We developed an automated blockchain-based conversion system that translates operational business data into "policy-ready" reports for institutional bodies like the JRC and Eurostat. Additionally, we established the regulatory protocols for upcycling, defining the safety and compliance criteria necessary to transform food side-streams into authorized ingredients for the food and feed markets.

THE OUTCOME:

WASTELESS has moved the industry from theoretical waste reduction to **precision monitoring**. Our involvement has produced:

- **A Harmonized Methodological Passport:** Enabling the standardisation of FLW data across diverse supply chains, including dairy, meat, and aquaculture.
- **The "Waste-to-Asset" Regulatory Gateway:** A validated legal roadmap that de-risks the repurposing of side-streams for industrial operators.
- **A Future-Proof Digital Toolkit:** Ensuring that SMEs and large-scale food business operators (FBOs) can meet emerging EU reporting obligations with zero administrative friction, effectively supporting the goal of a **20% annual reduction** in food waste.

Table of Content

A. PROJECT CORE IDENTIFICATION

INTRODUCTION

Advance the monitoring, quantification, and reduction of food waste within European production systems

The management of food loss and waste (FLW) has become a primary economic and environmental priority for the EU, shifting from a localized sustainability concern to a central pillar of the Farm-to-Fork strategy.

Within the WASTELESS initiative, WIISE acted as the strategic link between digital traceability innovation and institutional reporting standards.

Our contribution ensured that the deployment of advanced tracking tools remained fully aligned with European statistical nomenclatures and waste governance, establishing WIISE as a pivotal authority for consortia seeking to reconcile industrial operational data with official regulatory compliance

I. FACT SHEET

FULL PROJECT TITLE (ACRONYM):

Waste Quantification Solutions to Limit Environmental Stress (**WASTELESS**)

PROJECT DESCRIPTION:

An international research and innovation initiative focused on engineering a harmonized methodological framework and a digital toolbox to measure, monitor, and significantly reduce food loss and waste (FLW) across the European Union.

REFERENCE PROGRAMME (CALL):

Horizon Europe (HORIZON-CL6-2022-FARM2FORK-01-08)

FUNDING BODY:

European Commission / European Research Executive Agency (REA)

SELECTION EXCELLENCE:

Demonstrating high strategic and scientific value, WASTELESS was one of only **three** projects selected from **41** global submissions for this specific Horizon Europe call, achieving a highly competitive success rate of **7.3%**.

CONTRACT ID:

Grant Agreement No.: 101084222

DURATION:

Start Date: 01/01/2023

End Date: 31/05/2026

PROJECT BUDGET:

Total **€5,458,233.00**

II. CONSORTIUM

CONSORTIUM:

- **Coordinator:** Universidade de Trás-os-Montes e Alto Douro (UTAD) – Portugal.
- **WIISE's Role:** Partner and lead technical-legal representative for the Italian cluster, responsible for the development of the Open-Innovation Blockchain system.
- **Partners:** 29 organizations from 14 countries, including prominent research institutes, technology providers, and industrial stakeholders across the European food supply chain.

PARTNERS LIST:

Beneficiaries

These primary partners receive direct funding from the Horizon Europe programme:

- **UTAD** (Project Coordinator) – Portugal: utad.pt
- **Instituto Superior de Agronomia** (University of Lisbon) – Portugal: isa.ulisboa.pt
- **Agroscope** – Switzerland: agroscope.admin.ch
- **WIISE SRL** - Italy: wiisebenefit.com
- **SPES (Spread European Safety and Sustainability) GEIE** – Italy: https://spes-geie.eu/
- **Aitown SRL** – Italy: aitown.it
- **CNTA** (National Centre for Food Technology and Safety) – Spain: https://www.cnta.es/en/home-2/
- **EuroFIR** (European Food Information Resource) – Belgium: eurofir.org
- **Europatat** (European Potato Trade Association) – Belgium: europatat.eu
- **Fazla** – Turkiye: fazla.com
- **Hacettepe University** – Turkiye: hacettepe.edu.tr

- **Iseki Food Association** – Austria: iseki-food.net
- **JSI** (Jožef Stefan Institute) – Slovenia: ijs.si
- **SDU** (University of Southern Denmark) – Denmark: sdu.dk
- **Tartu Biotechnology Park** – Estonia: biopark.ee
- **University of Veterinary Medicine Budapest** – Hungary: univet.hu
- **VIMOSZ** (The Hungarian Hospitality Employers' Association) – Hungary: https://vimosz.org/en/fooldal/

Affiliated Entities

Partners providing national industry support and closely linked to the beneficiaries:

- **Colab4Food** – Portugal: colab4food.pt
- **Uve SA** – Spain: https://www.uvesa.es/
- **GVTARRA** – Spain: https://www.gvtarra.com/
- **Federalimentare** (Italian Food and Drink Federation) – Italy: federalimentare.it
- **FIAB** (Spanish Food and Drink Federation) – Spain: fiab.es
- **FIPA** (Portuguese Food and Drink Federation) – Portugal: fipa.pt
- **ANIA** (Association Nationale Des Industries Alimentaires) – France: ania.net
- **LVA** (Food Research Institute) – Austria: lva.at
- **SEVT** (Federation of Hellenic Food Industries) – Greece: https://www.sevt.gr/
- **PKCR - FFDI** (Federation of the Food and Drink Industries) – Czech Republic: pkcr.cz
- **GZS** (Chamber of Commerce and Industry of Slovenia) – Slovenia: http://www.gzs.si/
- **SETBIR** (Union of Dairy, Beef, Food Industrialists and Producers) – Türkiye: setbir.org.tr

GEOGRAPHICAL SCOPE:

Countries Involved:

Portugal, Italy, Spain, France, Switzerland, Belgium, Türkiye, Slovenia, Austria, Denmark, Estonia, Hungary, Czech Republic, and Greece.

Pilots:

Testing and implementation across the five stages of the food supply chains (primary production, processing and manufacturing, retail, food service, households) through case studies located in the countries of the WASTELESS' partners.

III. MISSION AND OBJECTIVES

MISSION

To establish a harmonized European framework for the precise quantification and monitoring of food loss and waste (FLW), providing the digital tools and regulatory clarity necessary to reduce environmental stress and meet the EU's 2030 sustainability targets.

SPECIFIC OBJECTIVES

1. **Standardize Quantification:** Develop a universal methodological framework and a robust set of activity criteria to ensure that food waste data is consistent, comparable, and transparent across all EU Member States.

2. **Deploy Digital Monitoring:** Implement an innovative "Toolbox" featuring WASTELESS tools and methodologies (T&Ms) (i.e. AI price prediction system, image analysis, surplus stock measuring system, automatic households' food waste assessment system and blockchain-based traceability to automate the tracking of surplus stock and waste in real-time.

3. **Operationalize the "Interoperability Bridge":** Define the FAIRness (Fair, Accessible, Interoperable, Reusable) of data obtained from T&Ms in different case studies, and usability for the Joint Research Centre (JRC) material flow analysis (MFA) model.

4. **Validate Circular Upcycling:** Establish the legal and safety protocols required to transform side-streams into high-value assets, defining the normative path for their reuse as authorized food or feed ingredients.

5. **Evidence-Based Case Studies:** Execute strategic pilots across different food sectors (e.g. chicken, beef, pork, dairy, aquaculture) to test and refine measurement tools within diverse, horizontally integrated supply chains.

6. **Policy Support and Scaling:** Provide actionable recommendations and decision-support systems for stakeholders along the entire value chain, directly contributing to a minimum 20% annual reduction in food waste.

IV. PROJECT RESULTS AND IMPACT

KEY PROJECT OUTPUTS

- **Standardized Methodological Framework:** A technical framework ~~manual~~ defining the criteria and metrics for food loss and waste (FLW) quantification across the EU.
- **WASTELESS Digital Toolbox:** A collection of measurement and monitoring resources including WASTELESS T&Ms.
- **Open-Innovation Blockchain System:** A digital architecture for the traceability and reporting of food side-streams and waste data.
- **Interoperability Bridge:** Identification of FAIR application from WASTELESS data, and data supply to the JRC.
- **Regulatory Compliance Reports:** Documents detailing the legal requirements and safety protocols for upcycling food waste into food and feed ingredients and promoting their marketing through the use of applicable *nutrition and health claims*.
- **Supply Chain Case Studies:** Data reports from five pilot implementations in the five stages of the food supply chain.

PROJECT OUTCOMES

- **Precision Quantification:** Transition from fragmented estimates to a high-resolution, data-driven understanding of waste generation across the EU value chain.
- **Administrative Simplification:** Reduction of the reporting burden for operators by integrating business data with institutional requirements.
- **Regulatory Certainty:** Establishment of a normative roadmap that identifies the legal pathways for circular economy and upcycling activities.
- **Strategic Waste Mitigation:** Contribution to the institutional target of a 20% annual reduction in food waste through data-based decision support.
- **Value Chain Integration:** Improved synergy between technology providers, food producers, and policymakers for a transparent food system.
- **Sustainability Alignment:** Advancement of EU Green Deal and Farm-to-Fork goals regarding resource efficiency and environmental impact.

B. FOCUS ON THE WIISE CONTRIBUTION

INTRODUCTION

In a complex initiative like WASTELESS, where the goal is to standardize food waste quantification across the entire European Union, technical data collection is only one part of the challenge. The primary obstacle to a circular economy is the "Data Interoperability Gap"—the lack of a common language between industrial operations and institutional reporting. WIISE (FARE) serves as the project's **Technical-Legal Mediator**, ensuring that every digital tool and monitoring methodology is fully synchronized with European regulatory standards.

While technical partners focus only on the development of AI sensors and tracking software, WIISE provides the **Regulatory Architecture** required to translate these outputs into policy-ready intelligence. Our contribution bridges the gap between raw supply-chain logistics and the stringent statistical requirements of bodies like Eurostat and the JRC. By integrating legal foresight directly into the digital value chain, we ensure that every innovation—from blockchain-based traceability to upcycling protocols—possesses the necessary "Metrological Passport" to meet EU Green Deal targets.

Our role is to demonstrate that achieving a 20% reduction in food waste requires a **Strategic Reporting Framework**: a system where operational side-streams are transformed from unaccounted environmental liabilities into transparent, compliant, and high-value assets.

V. ROLE AND OBJECTIVES WITHIN THE PROJECT

ROLE IN THE CONSORTIUM

- **Task leader/task contributor (WP1)**: development of harmonised FLW quantification framework; analysis of EU FLW and blockchain policy and regulatory framework; policy brief drafting for EU and national measures to prevent and reduce FLW.
- **Lead/task leader/ task contributor (WP2)**: leader of the digital tools and methodologies development group; development of electronic registry based on blockchain technology.
- **Task leader/ task contributor (WP3)**: test of blockchain registry in case studies; responsible for the assessment of tools and methodologies made by external experts.
- **Task Contributor (WP4):** Data standardization and integration of food loss and waste (FLW) metrics to the JRC MFA model.
- **Task Contributor (WP5):** Identification of regulatory barriers and compliance pathways for the valorisation of side-streams (e.g. novel foods, nutrition and health claims).
- **Task contributor (WP6):** Responsible for ensuring that the "WASTELESS Toolbox" aligns with EU objectives of measure and monitor FLW in all stages of the food supply chain.
- **Task contributor (WP7)**: cooperation with other EU-funded projects for the drafting of scientific papers related to FLW (i.e. food categorisation); communication and dissemination activities of the project and other results related to FLW; development of training modules for researchers and students.

SPECIFIC OBJECTIVES

- **Definition of FLW quantification framework**: improvement of FLW framework based on results of identified national and specific food supply chain policy frameworks.
- **Develop innovative tools and methodologies for FLW quantification**: improve the state-of-the-art of digital measurement and monitoring of FLW in different stages of the food supply chain and increase their use by different actors (e.g. food operators, households).
- **Lead the "Interoperability Bridge":** Define the technical-legal mapping to synchronize private sector operational data with official EU requirements.
- **Contributing to the Blockchain Architecture:** ensure data integrity and institutional transparency in the development of the blockchain-based reporting system.
- **Validate Upcycling Protocols:** Establish the safety and regulatory requirements for transforming food side-streams into authorized ingredients for the food and feed markets.
- **Ensure Policy Alignment:** Monitor and align the project's "activity criteria" with the mandatory reporting requirements of the EU Green Deal and the Farm-to-Fork strategy, and support policy changes with the help of dedicated policy briefs.
- **Coordinate Institutional Liaison:** Act as the primary link for communicating technical results to regulatory bodies like the JRC and Eurostat.

VI. ACTIVITIES AND WORK PACKAGES (WP)

PROJECT WORKPLAN TIMELINE (2023–2026)

The project follows a 42-month progression to move from methodological design to the final exploitation of the digital monitoring tools.

- **Year 1 (Months 1–12): Baseline & Methodology**
    - Development of the harmonized framework for Food Loss and Waste (FLW) measurement.
    - Initial design of the digital toolbox and blockchain reporting architecture.
    - Analysis of regulatory barriers and alignment with EU reporting standards.
- **Year 2 (Months 13–24): Development & Pilot Testing**
    - Launch of the 5 stages of the food supply chain case studies (Meat, Dairy, Aquaculture) across Europe.
    - Integration of the "Interoperability Bridge" to link industrial data with official statistics.
    - Technical testing of upcycling protocols for unavoidable food side-streams.
- **Year 3 (Months 25–36): Validation & Policy Synthesis**
    - Large-scale validation of the WASTELESS Toolbox across diverse food systems.
    - Initial submission of policy recommendations to EU and national policy makers.
    - Testing of the decision-support systems for stakeholders and industry partners.
- **Extension Period (Months 37–42): Final Exploitation & Impact**
    - Finalization of the "Handbook for FLW Quantification" for European SMEs.
    - Completion of the long-term impact assessment of the circular upcycling pilots.
    - Final dissemination of project results to institutional bodies and market exploitation of the digital assets.

CONTRIBUTION TO THE PROJECT WPs

Throughout the project lifecycle, WIISE ensures that the technical innovations developed in WP2 and tested in WP3—from AI-based sensors to blockchain monitoring—are fully compliant with EU regulatory standards identified in WP1, to be included in the WASTELESS Decision Support Toolbox to permit the most compliant selection for the relevant stakeholders.

By supporting the "Interoperability Bridge" in WP4 and defining safety protocols for upcycling in WP5, WIISE bridges the gap between raw industrial data and official EU reporting requirements. The previous activities are properly communicated and disseminated as part of WP7 to increase the replication of the project's results.

Activity Groups / WP	**Activities Performed by WIISE (FARE)**
Development of digital tools and methodologies (WP2)	Lead of the T&Ms development team, and participation in the development of the blockchain registry (PR1).
Data Interoperability (WP4)	Led the logical design of the **Interoperability Bridge** to synchronize raw food waste data with official EU statistical requirements.
Blockchain Governance (WP1/WP2)	Developed the technical-regulatory specifications for the **Blockchain-Based Electronic Registry** (PR1) to ensure data integrity and transparency in food waste reporting.
Regulatory Validation (WP5)	Defined the **legal and safety protocols** for the valorisation of unavoidable food loss and waste, identifying pathways to convert side-streams into authorized food/feed ingredients.
Policy Alignment (WP1/WP4)	Monitored the project's quantification methodologies to ensure strict compliance with the **EU Delegated Decision 2019/1597** and the Farm-to-Fork strategy targets.
Strategic Dissemination (WP7)	Leveraged specialized agribusiness channels, including editorial contributions on **foodtimes.eu**, to communicate technical results to industry leaders and European policymakers.
Institutional Liaison (WP7)	Facilitated the exchange of validated project outcomes with institutional stakeholders (JRC, Eurostat) to support the harmonization of food waste measurement across the EU.

SUMMARY OF REGULATORY & TECHNICAL STEPS

As a strategic technical-legal partner, WIISE (FARE) focused on developing the regulatory and digital architecture required to harmonize food waste monitoring and enable the upcycling of side-streams within the EU Market.

Phase	Objective	Actions Taken
I. Data Governance	Establish Interoperability	Defined the **logical mapping** for Task 4.1 to synchronize business-level logistics data with official EU requirements.
II. Registry Compliance	Ensure Legal Integrity	Conducted the **regulatory assessment** of the Blockchain-Based Electronic Registry to ensure data privacy and compliance with EU reporting standards.
III. Legal Pathways	Enable Upcycling	Led the identification of **regulatory barriers** and safety protocols for converting unavoidable food waste into authorized food and feed ingredients.
IV. Policy Alignment	Institutional Compliance	Validated the project's measurement methodologies against the **Commission Delegated Decision (EU) 2019/1597** to ensure official policy readiness.
V. Strategic Outreach	Bridge Industry & Policy	Facilitated the transfer of results to **JRC and Eurostat** through specialized agribusiness lobbying and editorial dissemination via **foodtimes.eu**.

VII. RESULTS, IMPACT, AND OPPORTUNITIES

SPECIFIC PROJECT OUTPUTS PRODUCED BY WIISE

- **Interoperability Logic (Task 4.1):** Development of the logical mapping and table structure to harmonize industrial food waste data with official EU statistical nomenclatures (**NACE/CPA codes**).
- **Regulatory Compliance Assessment:** Detailed legal analysis of the **Blockchain-Based Electronic Registry** to ensure its architecture aligns with EU data governance and reporting standards.
- **Upcycling Legal Pathways:** Identification of the regulatory barriers and the necessary food safety protocols (EFSA/Feed hygiene standards) to transform side-streams into **authorized ingredients**.
- **Institutional Policy Contributions:** Drafting of technical notes for institutional stakeholders (JRC, Eurostat) regarding the alignment of project data with the **EU Delegated Decision 2019/1597**.
- **Technical Dissemination Series:** Publication of specialized editorial content on **foodtimes.eu** (and related WIISE platforms) to translate complex regulatory findings for the agribusiness sector.

IMPACT GENERATED BY WIISE

- **Regulatory De-risking:** By clarifying the safety requirements for upcycling, WIISE provides a clear legal framework for SMEs, reducing the risk of non-compliance in circular economy investments.
- **Data Legitimacy:** Ensuring that the digital tools produced by technical partners generate data that is "legally portable" and recognized by EU statistical authorities.
- **Agribusiness Visibility:** Broadening the project's reach within the industrial sector through specialized legal-journalism, ensuring the WASTELESS Toolbox is known to decision-makers.
- **Administrative Simplification:** Designing the logic that allows for the automated conversion of raw business data into compliant EU reports, reducing the burden on food operators.

OPPORTUNITIES CREATED

- **Standardized Reporting for SMEs:** Established a replicable model for small and medium-sized enterprises to automate their food waste reporting without excessive administrative burden.
- **New Revenue Streams:** Identified legal "waste-to-value" pathways that allow industrial partners to monetize unavoidable side-streams that were previously considered financial liabilities.
- **Harmonized EU Data Hub:** Facilitated the potential integration of national data hubs into a single, interoperable European monitoring system for food loss and waste.

CONCLUSION

LESSONS LEARNED

Through WASTELESS, WIISE has consolidated its expertise in harmonizing food waste measurement with EU legal standards and navigating the regulatory complexities of circular upcycling. We have demonstrated that digital tools like blockchain only achieve institutional value when mapped to official nomenclatures and food safety protocols. These insights are now integrated into our consultancy services, offering a proven methodology to transform unavoidable waste into legally compliant, high-value assets within the EU Single Market.

WHY PARTNER WITH WIISE?

Our successful contribution to the technical-regulatory architecture of the **WASTELESS** consortium demonstrates that WIISE (FARE) is the strategic partner for international research projects requiring:

- **Data-to-Policy Expertise:** Proven ability to bridge the gap between industrial logistics and institutional statistics by mapping business data to official EU nomenclatures (**NACE/CPA**).
- **Circular Economy Compliance:** Specialized mastery in navigating the legal safety requirements for **upcycling**, ensuring that food side-streams can be legally reclassified as high-value ingredients.
- **Regulatory Validation of Digital Tools:** Expert oversight of blockchain-based registries and AI monitoring systems to ensure they meet the stringent data integrity and reporting standards of the **EU Green Deal**.
- **Targeted Dissemination:** Direct access to influential agribusiness platforms like **foodtimes.eu** and **GIFT (Great Italian Food Trade)**, ensuring results reach both industry leaders and European policymakers.
- **Multi-Stakeholder Mediation:** Expert capacity to align the diverse interests of academic researchers, industrial SMEs, and institutional bodies like **JRC and Eurostat**.

DIRECT CONTACT FOR PARTNERSHIPS:

Andrea Adelmo Della Penna, WIISE Project Officer

mail: res@wiise.net

Dario Dongo, WIISE Legal representative

Mail: dario.dongo@wiise.net

wiisebenefit.com