



Living Lab Consorzio Pecorino Toscano



Co-funded by
the European Union

CODECS has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement No 101060179. 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.

Contents

- CODECS in a nutshell
- Living Labs in CODECS
- Demonstration environment
- Living Lab of Consorzio Pecorino Toscano
- Living Lab overview
- Key Stakeholders
- Focus of the Living Lab
- Technology Description
- Analysis of the process transformation
- Stakeholders' perceptions
- Demonstration event

CODECS in a nutshell

CODECS (maximising the CO-benefits of agricultural Digitalisation through conducive digital ECoSystems) is on an exciting journey to bring the idea of "sustainable digitalisation" to life. Through creative concepts, innovative methods, helpful tools, and real-world evidence, CODECS is crafting a vision that will empower everyone to better understand and navigate the digital transformation of farming.

The goal is to improve the collective capacity to understand, assess and foresee the full range of benefits and costs of farm digitalisation, and build digital ecosystems that maximize the net benefits of digitalisation.



Living Labs in CODECS

CODECS has established a network of **21 Living Labs**, comprised of farmers, knowledge intermediaries, stakeholders, and policymakers, to address emerging agricultural challenges. These Living Labs will take a system-level approach to analyse farms and evaluate the impact of digital technologies on economic, social, and environmental outcomes. By examining the synergies and trade-offs between these different factors, the Living Labs will provide valuable insights to inform policymaking and support sustainable farming practices.



Demonstration Environment

In CODECS, **demonstration events** will be held throughout the project's lifetime.

Their objective is to showcase digital technologies for agriculture to the Living Labs' stakeholders and ecosystem, while also gathering empirical information on the costs and benefits of these digital solutions.



In the context of the project, each Living Lab will select at least one Demo Farm to demonstrate a digital technology for learning purposes.

Living Lab

Consorzio Pecorino Toscano

Maremma, in southern Tuscany, is a land of natural beauty and rich tradition, spanning the provinces of Livorno and Grosseto. Founded in 1961 by 21 breeders, Caseificio Sociale Manciano now unites 250 dairy farmers and produces organic Pecorino Toscano PDO cheese from 60,000 sheep. With fewer sheep farmers each year, milk production is declining, threatening Maremma's cheesemaking tradition. Technology can simplify farming, making it more appealing to younger generations while sustaining this vital heritage. At the core of this evolution is the implementation of a cutting-edge ***Farm Management Information System (FMIS)***.

The FMIS relies on **optimizing production and sheep care** by seamlessly integrating data on sheep health, feeding patterns, and milk quality, empowering farmers to make smarter, data-driven decisions.

- **Key goals:**

- Boost efficiency and sustainability in farming.
- Preserve traditions while embracing modern practices.
- Combat land abandonment and the decline of sheep farmers.
- Attract younger generations to revitalize the agricultural community.

A Thriving Future Rooted in Rich Heritage

The Pecorino Toscano Living Lab story is one of resilience and transformation. By intertwining tradition with innovation, this initiative ensures the enduring success of local farming, nurturing its cultural and agricultural legacy for generations to come.

Living Lab Overview

Living Lab: Consorzio Pecorino Toscano DOP

Associated partners: University of Pisa, Consorzio Pecorino Toscano

Country: Italy

Location: Southern Tuscany

Sector of Production: Extensive dairy sheep farms

Focus: Integration of tradition and innovation in the Pecorino cheese supply chain





Key Stakeholders

- 223 breeders
- 18 dairy factories
- Cooperative dairy factory “Caseificio Sociale di Manciano” (the demo farm that the FMIS will be tested)
- Technical staff of the Consorzio Pecorino Toscano DOP
- Researchers from the University of Pisa and the National Research Centre (CNR)
- Technical staff of the social cheese dairy in Manciano
- Technical staff (agronomist and veterinary) supporting the farms
- IT developers

Focus of the Living Lab

The Pecorino Toscano DOP Living Lab in Tuscany, focuses on extensive dairy sheep farming, leveraging digital technologies to enhance production quality, improve farmers' work-life balance, increase farm visibility, and promote animal health and welfare.

Bringing together farmers, technical advisors (including veterinarians and agronomists), cooperatives, cheese producers, technology developers, the University of Pisa, and the Tuscany Region, the initiative fosters collaboration to streamline data collection. By integrating sheep-level information across new and existing databases, it provides a holistic approach to managing key parameters like health, feeding practices, and milk production, supporting more efficient and sustainable farm operations.

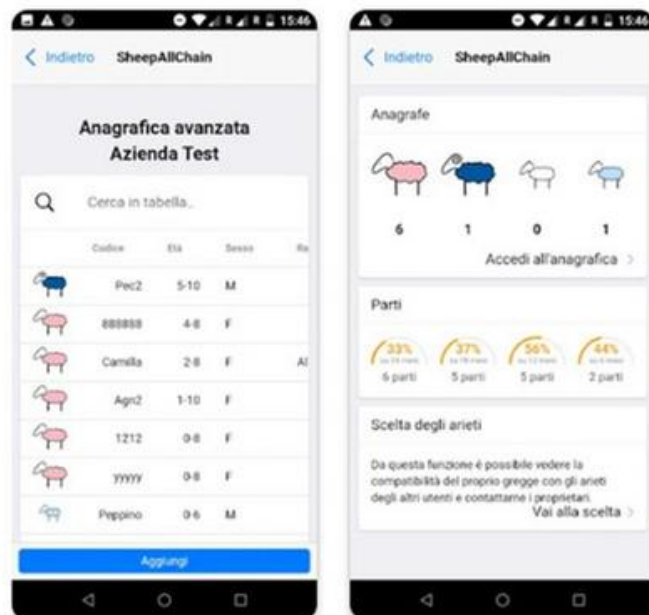


Technology Description

The FMIS relies on a web service application designed to facilitate data management, visualization, and analysis on extensive sheep farms.

Objective

The **aim** of the technology is to enhance the **efficiency of cheese-making and sheep management**, while also improving health monitoring. The FMIS stores detailed sheep-level information and integrates both new and existing databases managed by various stakeholders. This system covers crucial parameters, including sheep health, feeding practices, as well as the quantity and quality of milk production. By streamlining and centralizing data, the system plays a key role in easing the data collection process for farmers.



Main functions:

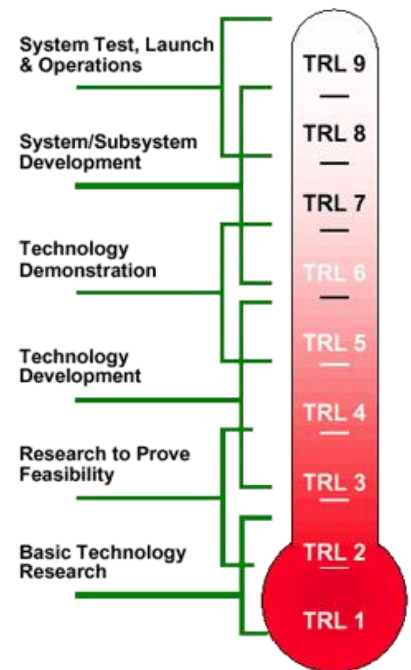
- Mass loading of National Database data from the Excel / CSV format of the BDN
- Viewing and editing data by individual animal
- Management of entries (births and purchases)
- Output management (deaths, sales and slaughter)

Technology Description

Current status

The FMIS is currently undergoing a **pilot phase**, during which it is being tested by farm advisors and selected farms. This phase is critical for gathering practical insights and ensuring that the system meets the real-world needs of its users. Concurrently, new functionalities are being developed in collaboration with the Living Lab, enabling iterative improvements and ensuring that user feedback drives innovation. Due to its current state of development and deployment, the FMIS is classified with a Technology Readiness Level (TRL) of 6, signifying a technology prototype demonstrated in a relevant operational environment.

A future aspiration is to incorporate product traceability as an additional feature. This enhancement would enable significant benefits such as improved supply chain transparency, enhanced food safety, and added value for consumers and stakeholders alike.



Technology Readiness Level (TRL) scale

Analysis of the process transformation

The results of this analysis stem from process modeling conducted during the project, offering valuable insights into agricultural transformation. The modeling established the Living Lab framework, showcasing how actors, resources, and innovations interact within the system. By comparing processes before and after the adoption of digital technology, the analysis highlights the impact of innovation on efficiency and relationships. This framework serves as a guide to understanding and optimizing agricultural systems, paving the way for sustainable and innovative practices.

In the digitised system of Pecorino Toscano DOP

- **Efficient Monitoring:** Agronomists reduce on-site visits by remotely monitoring animal feeding through data uploaded by farmers via the app.
- **Real-Time Insights:** Veterinarians access real-time health data for individual animals across multiple farms, streamlining their work.
- **Simplified Processes:** Automation removes redundant steps, enhancing efficiency and collaboration.
- **Broader Reach:** These innovations enable agronomists and veterinarians to provide advisory services to more farmers, improving overall support.

Socio-economic background and Cost - Benefit perceptions

In autumn 2023, the Pecorino Toscano DOP Living Lab hosted its first annual workshop, marking a key step in the project. The workshop gathered insights from stakeholders, focusing on the **social**, **economic**, and **environmental impacts** of **farm digitalization**. Discussions centered on understanding both the challenges and advantages of digitalization, providing a comprehensive view of its effects. This collaborative session set the stage for informed decisions, ensuring the project's goals align with stakeholder needs.

Benefits on the Farm Level

- Possibility for the cheese factory to estimate both milk quantity and quality in advance.
- Improved efficiency in the advisors' work, such as keeping track of events (e.g., pregnancies, births, deaths, diseases).
- Long-term cost savings from reduced waste, optimized resource use, and improved animal health management.
- The possibility for farmers to receive richer information about their milk after the lab analyses in the factory.
- Better decision-making capabilities due to real-time data and advanced analytics.
- Optimized management of the animals. Reduced paperwork.

Benefits on the Community Level

- Maintenance of the farmers in the area and the avoidance of land abandonment.
- Availability of products with higher quality Improved competitiveness in the market by adopting cutting-edge technologies and meeting consumer demand for transparency and sustainability.

Stakeholders' perceptions

- **Breeders:** Generally positive about the benefits, particularly in improving breeding practices and overall herd health. Concerns mainly revolve around the initial cost.
- **Agronomists:** Focus on the long-term benefits of increased yield and sustainability. They emphasize the need for comprehensive cost-benefit analysis before implementation.
- **Veterinarians:** See significant benefits in terms of animal health monitoring and disease prevention but highlight the necessity for reliable data and consistent updates.
- **Farmers:** Mixed perceptions, with larger farms more inclined towards adopting digitalization due to the potential for higher returns on investment, while smaller farms are cautious due to the cost implications.
- **Policy Makers:** Supportive of digitalization for its potential to enhance food security and sustainability but stress the need for subsidies or financial support mechanisms to offset initial costs.



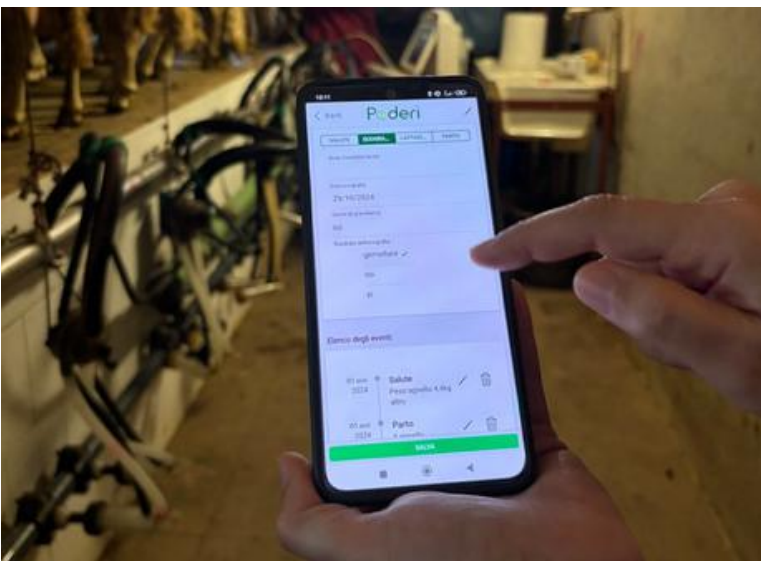
Demo Event

A New Era for Dairy Sheep Farming

In October 2024, the Pecorino Living Lab hosted its first demonstration event, marking a significant milestone in the evolution of dairy sheep farming.

Held at the DEMO FARM Diani in Campagnatico, Italy, the event showcased the transformative power of an Integrated Management System tailored for the dairy sheep sector.

Through a fast and intuitive app, participants experienced firsthand how technology can streamline farming practices, improve productivity, and ensure sustainability for the future.



Demo Event

A New Era for Dairy Sheep Farming

Bringing Together the Best

The event was organized by the Consortium for the Protection of Pecorino Toscano DOP, with invaluable support from the University of Pisa. Together, these collaborators created an engaging platform to highlight innovative solutions for the challenges faced by dairy sheep farmers.

A Community United

The demo event welcomed a diverse audience, representing key stakeholders in the dairy sheep sector:

- **Farmers:** The heartbeat of the industry, eager to embrace new tools for their craft.
- **Advisors:** Experts dedicated to guiding sustainable practices.
- **IT Providers:** Innovators designing cutting-edge tools for modern agriculture.
- **Supply Chain Actors:** Partners committed to enhancing the journey from farm to table.





CODECS



Contacts:

Project coordinator:

Gianluca Brunori | gianluca.brunori@unipi.it

Living Lab contact:

Alina Silvi | alina.silvi@agr.unipi.it

Follow Us on Social Media:



Relevant links:

[CODECS Website](#)

[CODECS Digital Platform](#)