



LOCATION



Finland and Spain

PARTNERS



5.2

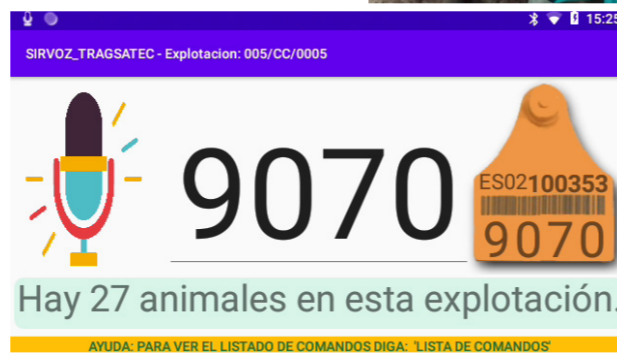
Farm of Things in Extensive Cattle Holdings

CHALLENGE

Current production environments for dairy and related products suffer from problems in relation to the lack of information from farms about animal well-being, crop and soil properties, inaccuracy of animal details such as animal identification and lack of transparent production processes.

AIM

This pilot focuses on improving animals' well-being and health in dairy farms, and how this can affect the quality and information of processed products, also considering cereals and eggs as raw materials. This pilot also considers the collaboration of farmers and end-user involvement in quality testing and feedback provision.



HOW

The problem is approached from the following perspectives: (i) ensuring the optimal feeding of cows by managing animal wellness and measuring crops and soil properties (irrigation, need for fertilising), (ii) improving the production management in a livestock farm integrating new technologies into the daily operations, (iii) integrating data brokering solutions in current production systems of dairy products and pastries, and (iv) end-user feedback management. New technologies such as sensor and surveillance systems as well as new software on smart glasses and a smart watch will be implemented.

BENEFIT

The project will result in production costs optimisation, better product quality, improved animal welfare, better farm work organisation and reliable traceability through animal identification and livestock management. Also, it will increase end-user involvement by allowing feedback on items such as recipes, ingredients and more.



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DEMETER Integration

The three use cases that compose Pilot 5.2 have successfully integrated their solutions with DEMETER. Key technologies used include smart glasses to obtain animal data, IoT platforms (AFarCloud Middleware, FIWARE Orion Context Broker and QuantumLeap) and sensors to monitor soil, grass digestibility and environmental conditions. The integration of these technologies was carried out through the DEMETER core enablers, i.e., Agricultural Information Model, Semantic Mappings to AIM, Data Management and Data Preparation & Integration.

Regarding service discoverability, the DEMETER Enabler Hub, the Brokerage Service Environment and the Access Control System enablers are being used. The DEH Client enabler is used to monitor the metrics of components. Finally, the Benchmarking enablers offer an assessment on the farms' productivity compared to other farms.



Feedback From Farmers

Concerning UC#1, the Farmer Collaboration Tool (FCT) has been successfully used during the 2023 harvest in the Kotipelto farm, to monitor activity in the fields and instruct workers in 6 vehicles. The real-time monitoring of the tractors and the degree of performance of the tasks was a highly valued feature since it allows workers to better plan next phases.

The veterinarians and farmers participating in UC#2 highlighted the usefulness of the tools developed. Veterinarians can check livestock in an easier and more comfortable way, reducing errors and time spent. End users in UC#3 provided feedback related to integrating data brokering solutions into today's bakery production systems. DEMETER ecosystem provides tools to ensure that quality information on primary products is present and can be used in agreements and contracts with food providers.



Outcomes

The FCT allows farmers organize harvesting activities efficiently, considering data collected from diverse data sources (robots, open weather stations, ISOBUS devices, sensors) using a DEMETER ecosystem. Three ad-hoc enablers have been developed to foster the interoperability with the AFarCloud smart farming community, two of them for data transformation and integration, and another one to adapt AFarCloud data to the DEMETER Adaptive Visualization Framework (AVF).