sheeptoship LIFE

Looking for an eco-sustainable sheep supply: environmental benefits and implications

Layman's Report

Italian National Research Council
Institute of BioEconomy

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Executive summary

This report summarises the main SheepToShip LIFE project results and outcomes, addressed to the general public and non-technical audience. All results, findings and communication materials are available at sheeptoship.eu

Project team is grateful to all farmers and technical staff who supported SheepToShip LIFE during this successful five years' experience.

“Sheep farming has very ancient origins and is an economic activity of absolute importance throughout the world.

With more than ten thousand active farms and three million head of sheep, Sardinia is an ideal laboratory for testing rural development strategies that integrate the fight against climate change with the enhancement of sheep systems”.

Agriculture has a major responsibility in greenhouse gas emissions. SheepToShip LIFE quantified emissions from the dairy sheep sector in Sardinia and applied mitigation techniques on demonstration farms to reduce emissions by 20% within ten years.

Project's goals

To improve

the environmental performance of sheep production systems in Sardinia.

To promote

technological improvement and the transfer of eco-innovation to actors in the sector

To facilitate

the implementation of agri-environmental policies based on a life-cycle approach geared towards enhancing the environmental quality of the sheep sector

To increase

public knowledge and awareness of the environmental sustainability of dairy sheep products and climate change mitigation through the adoption of eco-innovations

The LCA approach made possible to take a picture of the environmental footprint of the whole dairy sheep supply chain at the Sardinian regional scale, in particular linked to cheese production with protected designation of origin (PDO).

Sheep systems were characterised through the study of model farms, representative of the main sheep farming systems on the island.

SheepToShip LIFE has thus defined the factors that have the greatest impact on GHG emissions, of which methane (CH_4), which comes from the rumination of sheep, accounts for 60% of the total; animal manure accounts for 7.5% of total emissions, while the purchase of products to feed the flock or for pasture management (fertilisers, seeds) accounts for 18%; 8% of GHG emissions come from self-produced feed for the flock. Other processes account for the remaining 6.5%.

The total supply chain emissions estimated at regional level for the period 2016-2017 evaluated the entire sheep sector accounting for more than 1600 kt of CO_2 eq, equal to 5.5% of total emissions related to the Italian agricultural sector.

Budget totale

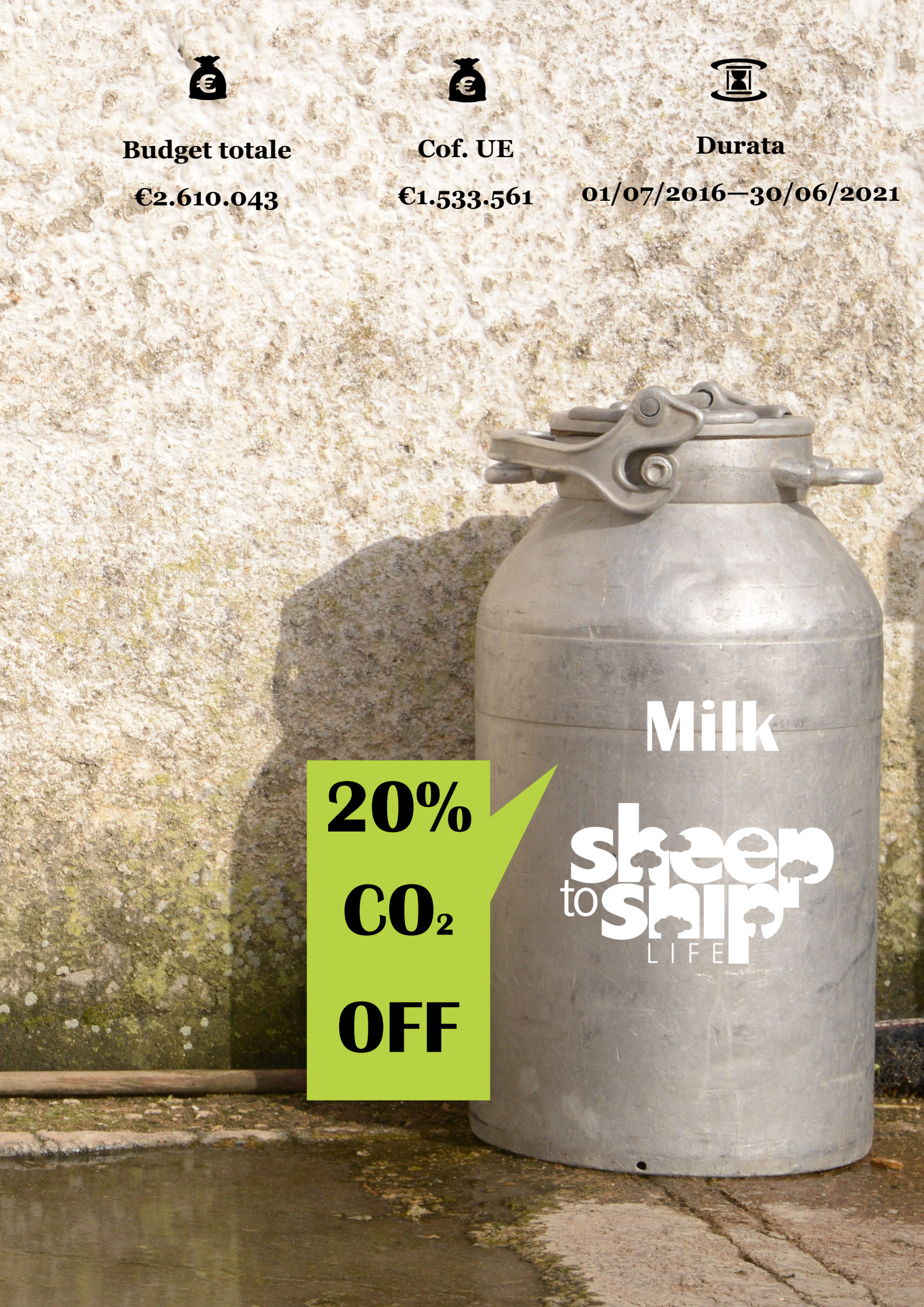
€2.610.043

Cof. UE

€1.533.561

Durata

01/07/2016—30/06/2021



The analytic approach and the identification of good practices

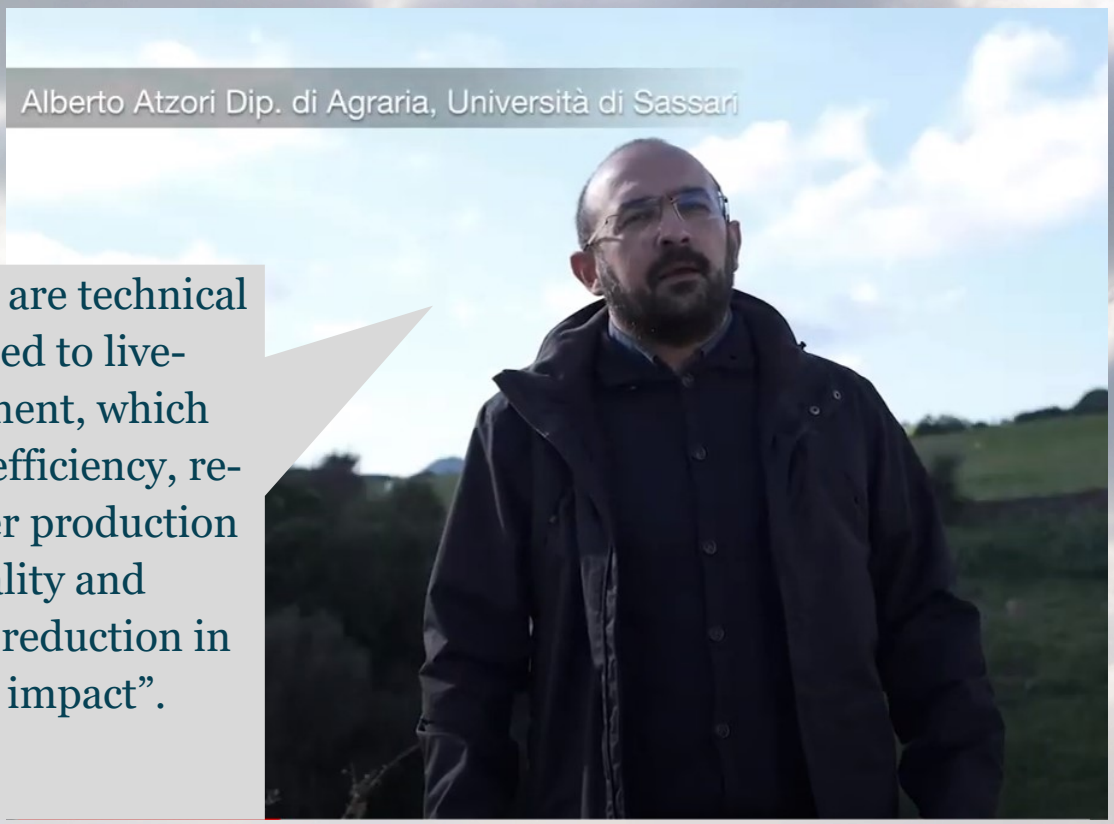
Three specific steps enabled the determination of the corporate carbon footprint:

1. the identification of the main sources of greenhouse gas emissions in the different types of farms that joined the project;

2. the evaluation of technical aspects limiting the efficiency of milk production;

3. the declination of best practices towards a preliminary mitigation strategy;

The proposed solutions were based on the introduction of eco-innovations, through low-input mitigation techniques, while maintaining the production levels and standards of each farm.

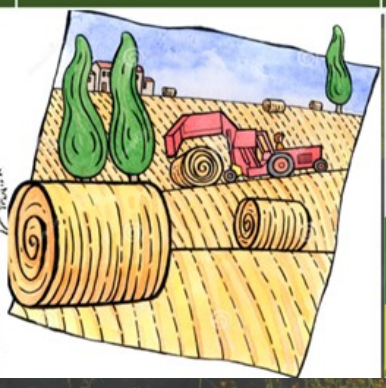


"Best practices are technical protocols applied to live-stock management, which improve farm efficiency, re-sulting in better production in terms of quality and quantity and a reduction in environmental impact".

Sardinia currently produces over three hundred mil-lion litres of sheep's milk.

How can emissions be reduced by 20% maintaining sa-me productions?

Through interventions aimed at:

Animal management	Animal feed production	Feed crop cultivation management	Energy production and consuption
			

"Improved production efficiency can be achieved for example through:

- measuring the milk produced by each animal
- the targeted culling of less productive animals".

Increasing production efficiency is important because the better you produce, the smaller farm's carbon footprint you produce.

"We used to have 250 head of cattle, now only 200.

We have reduced the number to be more self-sufficient with our pastures.

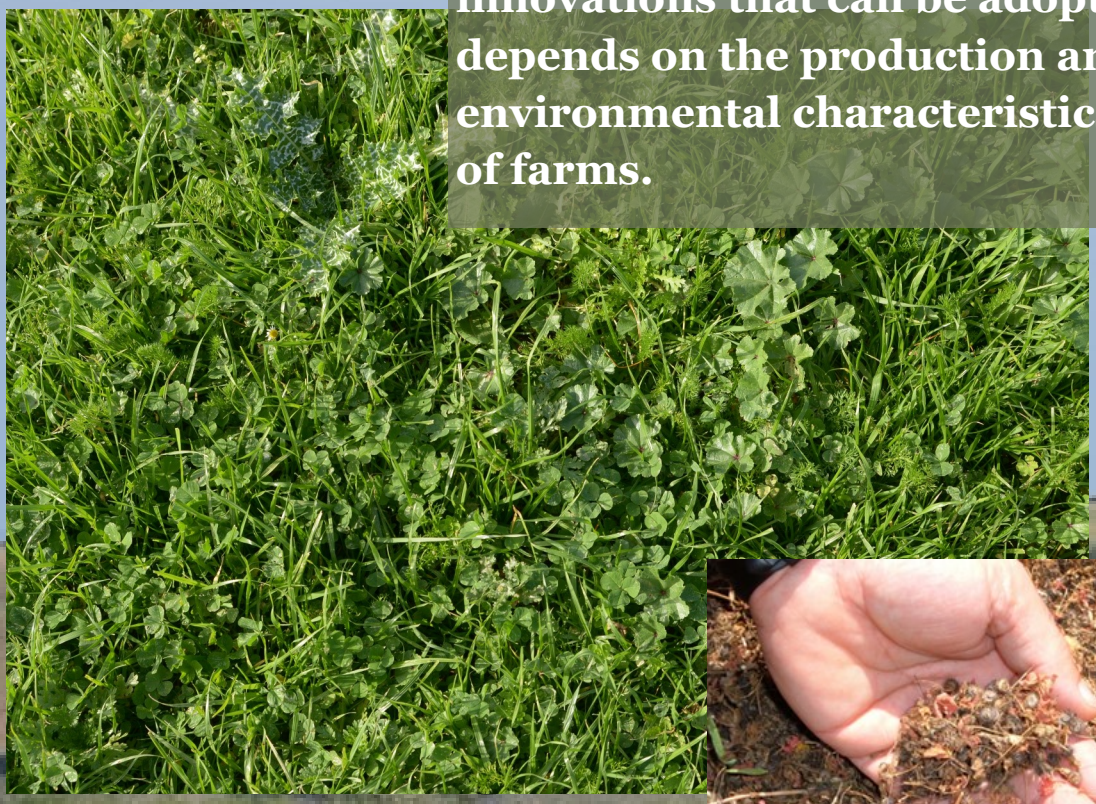
With 10-12 litres less milk we have a better cheese yield.

The milk production per head, which is fed mainly on self-seeding pasture grasses, has even increased".

Improving animal diets, for example, by relying on fresh fodder or wrapped hay, reduces enteric methane emissions and thus also helps reduce the greenhouse gas potential for each kg of milk produced.

“On the project's model farms, we selected seed mixtures for grazing, adapted to the environmental conditions of the individual farm, and observed positive results”.

The combination of eco-innovations that can be adopted depends on the production and environmental characteristics of farms.



Adopting self-seeding natural pastures allows to increase the quality of grazed fodder and to obtain a series of advantages:

- economic, by reducing the need for off-farm fodder and fertiliser;

- productive, by improving forage quality and digestibility;

- environmental, by improving the carbon sequestration performance of soils and reducing emissions of enteric methane and other greenhouse gases;

"You set up self-seeding pasture and no longer have to work the land in subsequent years, reducing tillage costs and the purchase of grass seed, improving your production, and becoming more self-sufficient with your pasture".

SheepToShip LIFE highlighted how supply chain actors with suitable attitudes towards innovation and climate change awareness are more willing to take concrete measures to reduce emissions.

“With a greater commitment on the part of public policies, both in terms of communication, provision of training services, coordination and collaboration between all the actors involved in the dissemination of innovations - such as technicians, research institutions, but also the farmers-innovators - it is possible to introduce new and more sustainable approaches in farm practices throughout the region”.

SheepToShip LIFE shared the eco-innovations of the project, with an open approach in listening to the perspectives, difficulties and suggestions coming from the rural world, integrating each contribution into its own path.

This was made possible through a participatory process addressed to all the actors of the supply chain in the region.

Pierpaolo Duce, IBE - CNR

"The Environmental Action Plan is the great result of the SheepToShip LIFE project: a Governance tool, with which it is possible to promote a sheep sector for Sardinia with high environmental, economic and social sustainability".

Also thanks to the reflections gathered during the participatory process with the main actors of the sector, the Environmental Action Plan suggests strategies to organise the supply chain, to improve the efficiency of the most productive companies, towards better market conditions, and to support the companies with lower productivity through the maintenance of ecosystem services and cultural heritage.

The Environmental Action Plan points the way to a possible transition that is not only ecological but also social and economic.

The niche of knowledge represented by SheepToShip LIFE can be refined, expanded and replicated, where the conditions exist, through new demonstration projects or actions of a more operational nature.

This is in line with the 2021-2027 European programming, which aims to promote an agricultural sector that cares for the environment and contributes to climate action by stimulating growth and employment in rural areas, sustainability and innovation.

SheepToShip LIFE represented a privileged laboratory in which to test new ideas and practices of sustainable development, competitive with current socio-technical practices aimed at milk and sheep cheese production.

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All communication materials, manuals, scientific publications and videos produced by the project are available at

sheeptoship.eu

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