LIFE 16 ENV/IT/000225 - LIFE TTGG

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Context

In order to limit **global warming** in the coming decades, the reduction of greenhouse gas (GHG) emissions will need to be substantial and cover all the productive sectors: not only the energy sector, which bears the main responsibility for direct global emissions, but also the agricultural sector, which today accounts for about 10-12% of total global emissions. Based on current data and projected increases in food consumption, greenhouse gas emissions from the agricultural sector are set to rise unless corrective action is taken.

The **European dairy sector** is one of the world's major players, both in terms of imports and exports. In addition to the wealth and jobs created in the EU, the environmental impacts of dairy farming in relation to global warming, water consumption, land use, etc. should not be underestimated.

In order to improve the efficiency of cheese production processes, analyze and reduce their environmental footprint and achieve more sustainable production and consumption, solutions need to be implemented throughout the whole production chain, not forgetting the consumption and waste management stages. In this respect, the European Commission has set ambitious targets to reduce greenhouse gas emissions and environmental degradation as part of the **European Green Deal.**

In line with the **Farm to Fork** strategy at the heart of the Green Deal, the LIFE 16 ENV/IT/000225 - LIFE The Tough Get Going project was set up to improve the efficiency of production processes for the hard cheeses Grana Padano PDO and Comté PDO - symbols of the geographical indications of Italy and France. Its aim was then to transfer the results to Europe, reduce the environmental impact of the processes and thus achieve more sustainable production and consumption.

An increasingly popular tool for analysis is **life cycle assessment** (LCA): a comprehensive analysis that takes into account the material and energy inputs and emissions associated with each stage of a product's life cycle, from resource extraction and processing to end use and disposal, to assess the quantified environmental load on specific impact categories.

Since 2013, the European Commission has developed its own LCA method called **Product Environmental Footprint** (PEF). The partners of the LIFE TTGG project decided to base their analysis and identify solutions, in the field of raw milk production and milk processing, by applying precisely the official EU PEF methodology to the Grana Padano PDO and Comté PDO hard cheese supply chains.

Project

The LIFE TTGG - The Tough Get Going project was the result of the synergy between universities, start-ups, manufacturing companies, Italian and French training and research institutions, with the aim of improving the efficiency of the European PDO cheese supply chain (in particular hard and semi-hard cheeses) and reducing the environmental impact, thus achieving a more sustainable production and consumption according to the standards of the European Product Environmental Footprint (PEF) methodology.

The most tangible result of the project is the development of ad hoc software: a real support tool for the environmental decisions of individual companies, capable of assessing the footprints of products and encouraging their reduction throughout the supply chain, from milk production to cheese processing and product packaging.

The software was developed, validated and tested during a five-year (2017-2022) period of work on the production contexts of Italian Grana Padano PDO and French Comté PDO cheese, with the aim of becoming a model for optimizing the environmental and economic performances of companies in other EU PDO and PGI agri-food product chains.

MAIN PROJECT STEPS

SUPPLY CHAIN ANALYSIS

- **implementation of Recommendation 2013/179/EU** and the related rules for dairy products on the assessment of the environmental performance of two PDO cheeses throughout their life cycle;
- **development of an LCI** (Life Cycle Inventory) **dataset** used by companies to simplify the calculation and reduce the time and costs required to assess the life cycle of dairy products, in accordance with PEF;

SOFTWARE DEVELOPMENT

- **development of a software** (Environmental Decision Support Tool - EDST) to support environmental decisions by companies producing PDO cheeses (hard and semi-hard) from cow's milk, aimed at optimizing performance from both an environmental and an economic point of view;
- **application of the best available optimization techniques** throughout the supply chain (cradle-to-grave approach) through the implementation of a software in order to identify, describe and assess in real cases the impact of the proposed technical solutions.

After developing an effective methodology, the task was to optimize the environmental and economic performance of farms, dairies and packaging manufacturers. Thanks to the results obtained, LIFE TTGG partners have contributed to increasing the know-how of stakeholders and consumers with informations that can also be used for “green” public procurement.

PEF Methodology

The European Union (EU) Product Environmental Footprint (PEF) methodology was created in 2013, with the aim of standardizing at EU level the calculation of the environmental footprint of products (goods or services) using a life-cycle approach, in order to promote green products with reliable and comparable information.

Milk and dairy products have played a central role in the development of the PEF methodology, contributing to the development of the sector rules called PEFCR (Product Environmental Footprint Category Rules) developed in 2018 by the European Dairy Association (EDA). These sector rules were used by the LIFE TTGG - The Tough Get Going project to calculate and reduce the environmental footprint of a wide range of hard or semi-hard PDO cheeses.

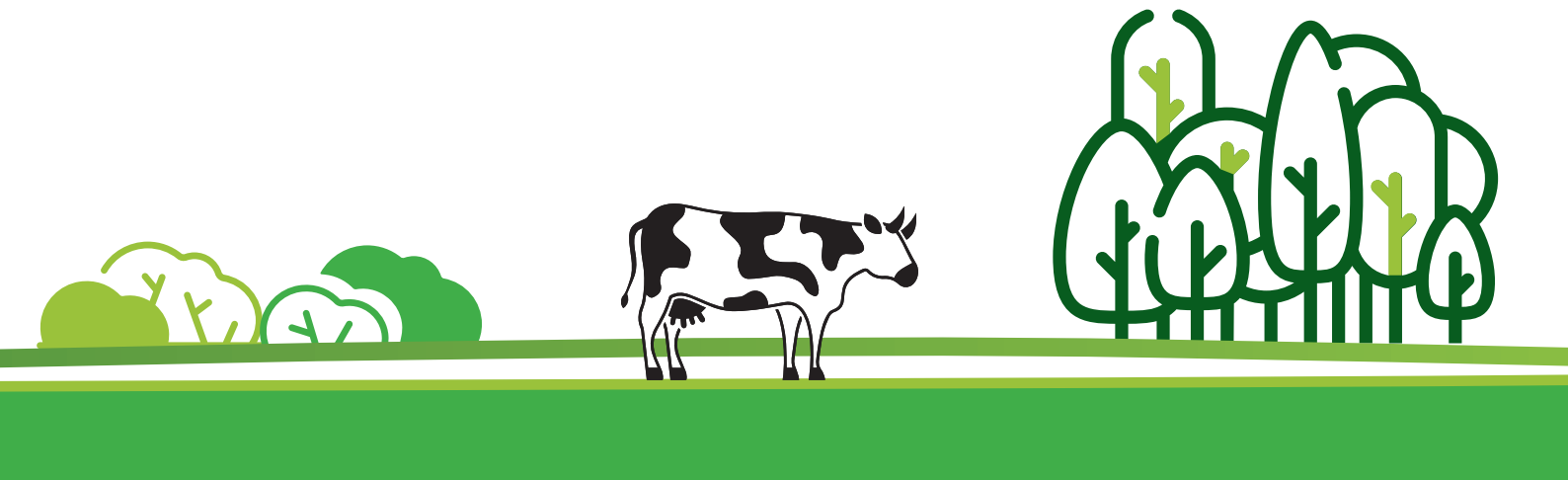
PEF is a robust method of providing reliable and comparable environmental information. Its unique features include the accuracy of the data used to quantify the environmental profile and the use of benchmarks for comparison.

As a European methodology, promoted by the EU Commission, PEF provides access to numerous business support and incentive tools, provided through the Green Deal strategy and Farm to Fork policies.

THE MAIN ADVANTAGES OF PEF

1. ***Measures sustainability:*** it is the key to calculating the environmental impact of products.
2. ***European standard:*** it is the official tool and reference model developed by the EU Commission.
3. ***Community incentives:*** it ensures access to EU incentive mechanisms - Green Deal and Farm to Fork in particular - based on the level and increase of sustainability.

In the coming years, the adoption of the PEF will be the main tool for demonstrating the sustainability of companies, and therefore for accessing the financial support instruments that are fundamental to the ecological transition of the agricultural and agri-food system.



Supply chain analysis

The partners of the LIFE TTGG project, starting in 2017, have analyzed a representative sample of companies belonging to the two production chains of Grana Padano PDO and Comté PDO, collecting information through data collection forms and technical instruments aimed at monitoring energy consumption (such as temperature probes, ammeters, etc.) in order to:

- measure the environmental profile of the two Grana Padano PDO and Comté PDO production chains;
- create a robust and reliable benchmark at consortium level. This will enable the development of targeted sustainability policies for PDO and PGI supply chains;
- propose solutions to improve the efficiency of the two production chains;
- develop environmental decision support software in order to systematize the efficiency of the production chain in the future and to allow quantitative monitoring of environmental sustainability over time.

SUPPLY CHAIN APPROACH, IN NUMBERS:

Companies involved - Grana Padano PDO

- 65 companies producing raw milk;
- 20 cheese producers and maturers;
- 18 packers.

Companies involved - Comté PDO

- 35 companies producing raw milk;
- 15 cheese producers and maturers.

Other Italian and European PDO consortia involved in the transfer of the methodology

- Asiago PDO (3 cheese producers and maturers);
- Provolone Valpadana PDO (1 cheese producer and maturer);
- Beaufort PDO - France (2 cheese producers and maturers);
- Abondance PDO - France (2 cheese producers and maturers);
- Queso MahÓn PDO - Spain (2 cheese producers and maturers);
- Stilton cheese PDO - England (2 cheese producers and maturers).

Software

The final result of the project is an Environmental Decision Support Tool (EDST) to measure, in a simple and pragmatic way, the environmental impacts of hard cheese production: from raw milk production through cheesemaking, packaging, use and end-of-life. The software makes it possible to assess critical points and identify improvement strategies for the entire supply chain.

The collaboration with the Consorzio Tutela Grana Padano and the Comté Interprofessionnel de Gestion du Comté (CIGC) offered the opportunity to test and calibrate the software at companies that are part of the production context of the two PDOs, paving the way for a reliable tool and proven methodologies to be transferred, with the appropriate interventions, to the other European PDO and PGI consortia and their companies, both in the dairy sector and in other Geographical Indication productions.

After the conclusion of the project, the software will be further developed to make it usable also within the Made Green in Italy and EPD environmental certification schemes.

WHAT CAN BE IMPROVED BY USING THE SOFTWARE

1. Environmental performance on farms

Analysis of the data collected from dairy cattle farms has made it possible to identify feasible measures for improving environmental performance. The software proposes optimized solutions for each production situation.

2. Energy efficiency in the dairy

The analysis of the data collected from the dairies has allowed the development of a set of energy efficiency actions, including heat recovery and renovation of refrigeration plants. Thanks to the software, each dairy can assess its own potential for reducing energy consumption and receive concrete suggestions on the most effective strategy for its business.

3. Product storage and reduction of food waste

The cheese life cycle analysis includes the packing, sale and consumption phases. At these stages, product waste reaches high percentages, becoming a critical point for the sustainability of the supply chain as a whole. The project has identified measures to combat food waste: from correct product storage to the donation of surplus food.

Advantages

Environmental decision support software provides numerous advantages in relation to different users:

PDO PGI COMPANIES

1. analyzes the environmental impact of PDO and PGI products according to a rigorous methodology called Product Environmental Footprint (PEF), recognized at EU level;
2. provides guidance on the most effective actions to reduce environmental impact and energy bills;
3. highlights the results achieved by the improvement measures implemented;
4. shows the positioning of each company using it compared to a specific and continuously updated benchmark, constructed ad hoc by averaging the performances of comparable companies;
5. constantly updates and provides indicators for corporate **sustainability reports**, so proving a very useful support for external communication;
6. it is easily upgradable to the Made Green In Italy scheme (promoted by the Ministry of Ecological Transition) and to The International EPD system: companies can thus quickly and cheaply obtain environmental product certifications according to these schemes→ in less time, at less expense, and without using so many technicians in the company.

PDO PGI PROTECTION CONSORTIA

1. provides a tool that is shared by and homogeneous for all consortia members, enabling the calculation of the specific environmental impact for the PDO;
2. thanks to the development of a shared methodology and the adoption of a single tool for all member companies, it enables equally specific improvement strategies and related communication activities to be set up;
3. it is an indispensable tool for supporting environmental impact reduction strategies and communication to stakeholders.

PDO AND PGI PRODUCT CHAINS

1. it is a reference tool for setting up and implementing strategies for the environmental sustainability of Geographical Indication productions, contributing to the dissemination of concrete and effective actions;
2. it supports the dissemination of environmental sustainability schemes, such as 'Made Green in Italy' in Italy and 'The International EPD system' at international level.

Partners

POLITECNICO DI MILANO - Project coordinator

An example of international excellence in teaching and research, the Politecnico di Milano is participating in the LIFE TTGG project with the Departments of Energy and Design.

CONSORTIUM FOR THE PROTECTION OF GRANA PADANO CHEESE

The Consorzio Tutela Grana Padano was founded in 1954 to promote, protect and supervise what has now become the most widely consumed PDO cheese in the world: Grana Padano. It can count on: 128 member producers, 149 maturers, 194 authorized packing companies, 4250 livestock companies supplying milk, for a total of 40,000 employees in the entire sector.

CENTRE NATIONAL INTERPROFESSIONNEL DE L'ECONOMIE LATIÈRE (CNIEL)

CNIEL is the trade association in France that brings together milk production and processing companies to decide on and coordinate collective actions at the service of the dairy chain. Set up in 1973, CNIEL represents the entire French dairy sector through the membership of federations of farmers, processors and cooperatives.

UNIVERSITÀ CATTOLICA DEL SACRO CUORE

A historic Italian academic institution, UCSC is participating in the LIFE TTGG project with the Department of Food Science and Technology for a Sustainable Supply Chain (DISTAS) and the Institute of Food and Nutrition Sciences.

QUALIVITA

Fondazione Qualivita is a cultural and scientific organization committed since 2000 to the development of knowledge systems for Italian quality food and wine production - in particular for PDO, PGI and TSG products - through publishing, research, communication and training projects.

ENERSEM

A spin-off of the Politecnico di Milano, Enersem carries out research and development and consultancy activities with the aim of reducing energy consumption in the civil and industrial sectors. It has developed EMS, for managing and optimizing energy consumption in companies, a valid complement to the EDST software.

ORGANIZATION FOR AN INTERNATIONAL GEOGRAPHICAL INDICATIONS NETWORK (oriGIn)

Founded in Geneva in 2003, oriGIn is a non-profit organization that brings together more than 500 producer associations and institutions related to Geographical Indications from over 40 countries.

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