

Digital tool to assess sustainability, efficiency and environmental impacts on dairy farms: NEU.rind

Climate action in Austria benefits from a new digital tool for assessing opportunities on dairy farms to reduce emissions. It allows the sustainability, efficiency and environmental impacts of a dairy farm to be assessed in two hours.

EAFRD-funded projects

Location: Austria

Programming period: 2014-2020

Priority: P1 - Knowledge transfer and innovation

P2. Competitiveness

P3 - Food chain and risk management

P4 - Ecosystems management

P5. Resource efficiency and climate

Focus Area: 1A. Innovation and cooperation

2A. Farm performance, restructuring & modernisation

3A. Agri-food chain integration & quality

5D. Greenhouse & ammonia emissions

Measures: M16 - Cooperation

Funding: Total budget 487 044 (EUR)

EAFRD 226 522 (EUR)

National/Regional 226 522 (EUR)

Private/own 34 000 (EUR)

Project promoter: OG NEU.rind*

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The user-friendly tool is available to many dairy farms. It provides key data and clear recommendations for action at individual farm level, e.g. reducing emissions or the demand for non-renewable resources.

Time savings result from the OG's project, which allows the sustainability, efficiency and environmental impacts of a dairy farm to be assessed in two hours. This was achieved by linking and consolidating existing data, expert knowledge from the scientific partners, and cooperation between many different partners along the production chain.

Project costs also included equipment upgrades (tractors, sprayers, grape sorters, and fertiliser spreaders) to enhance green management strategies, renewable energy installations, development of a new sustainable bag-in-box wine product, knowledge transfer events promoting best practices across the sector, acquisition of sustainable winemaking vats (amphorae, barrels), bottling lines, labelling machines, heat pump air conditioning systems, branding, e-commerce setup, and compliance with regulatory requirements. Outcomes allowed smaller wineries to access new markets.

Summary

In Austria, cattle and milk production account for a total of EUR 2 887 million, which is nearly 30% of the total production value of agriculture. Dairy farms are a significant stakeholder in the country's climate action goals and the NEU.rind EIP-AGRI Operational Group (OG) project aimed to improve the sustainability of Austrian dairy and cattle farming. It developed a new digital farm management tool for assessing sustainability, efficiency and environmental impacts.

*The project promoter/beneficiary is an EIP-AGRI Operational Group.
(https://eu-cap-network.ec.europa.eu/operational-groups_en)



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Project results

The project involved 19 farms and promoted wines that reflect The OG actions resulted in an easy-to-use tool showing the sustainability, efficiency and environmental impacts of individual farms compared to others in Austria. Specifically, the NEU.rind project helped to:

- strengthen the competitiveness potential for approximately 23 000 dairy farms throughout Austria;
- provide farmers with a new digital toolkit for benchmarking, assessing sustainability, efficiency, and environmental impacts for farm-specific management;
- estimate potential improvement options from implementing farm-specific recommendations that enhance farm sustainability by reducing emissions or other environmental impacts;
- facilitate key figures that are easy to understand and can be generated for the individual farm;
- reduce by 88% (compared to the existing system) the working hours involved in assessing the sustainability, efficiency and environmental impact of a dairy farm.

Key lessons and recommendations

- Reducing methane and nitrous oxide emissions from dairy farms can significantly reduce global greenhouse gas (GHG) emissions from livestock.
- Digital twin models are useful virtual representations of an agrifood sector's lifecycle that can be updated relatively efficiently from real-time data to allow scenario simulation, machine learning and reasoning to help make decisions.
- The broad participation and cooperation of partners from agriculture, science, government, and marketing ensured scientific correctness and good applicability in practice.

Context

As European nations strive to meet climate targets set by international agreements, addressing the sustainability of dairy farming practices becomes more imperative. Transitioning towards more sustainable methods can mitigate these impacts while ensuring food security for a growing population.

Dairy farming in Europe can significantly contribute to GHG emissions, primarily through methane and nitrous oxide release. Methane (produced during digestion in cattle) is a potent GHG with a global warming potential greater than carbon dioxide. Additionally, the use of synthetic fertilisers in dairy farming leads to nitrous oxide emissions, further exacerbating climate change. The scale of dairy production can also necessitate substantial land use and water consumption.

Dairy farmers can benefit from a better understanding of facts and figures about environmental impacts, resource efficiency and sustainability of milk production, as well as robust decision-making tools for supporting decisions in their business about farm improvements and/or diversification.

Studies show that milk in Austria is produced with a smaller ecological footprint than in other regions of Europe and the world. The reasons for the advantages of Austrian production are the land-based production, the high proportion of forage, the GMO-free (genetically modified organisms) feeding and the high proportion of dual-purpose breeds. These features characterise the Austrian way of dairy and cattle farming.

Additionally, legal requirements related to the Corporate Sustainability Reporting Directive (CSRD), Green Claims, Supply Chain and others enhance the need for tools supporting different stakeholders along the value chain.

An OG was established to help Austrian dairy farmers navigate these issues.

Objectives

The OG was established to help Austrian dairy farms:

- mitigate and reduce GHG emissions while ensuring and increasing competitiveness;
- provide recommendations for better efficiency, economic performance and sustainability of their businesses via new benchmarking and decision support tools with specific foci on environmental impact and animal welfare;
- clarify key meaningful, science-based figures related to sustainability and the environmental impact of Austrian dairy farms;
- develop an easy tool with the requested parameters related to the legal requirements for sustainability reporting.

Activities

The NEU.rind OG project developed a simple, practical tool to evaluate life cycle assessments and eco-efficiency for milk production. Key figures such as GHG, ammonia or nitrate emissions, food conversion efficiency and preservation of natural diversity were analysed and evaluated from dairy farm data. Findings were calculated per kilogram of milk, per hectare of land used, and per euro of contribution margin.

This involved developing:

- a 'digital twin' type model for assessing sustainability, efficiency and environmental impacts on dairy farms;
- a user-friendly system for additional data collection using the existing Cattle Data Network (RDV);
- meaningful and easy-to-understand key figures on important sustainability issues, efficiency and environmental effects;
- up-to-date facts and figures for representative farms in Austria as well as farm-specific measures for improvements;
- a system for farm comparisons to estimate improvement potentials (benchmarking);
- synergies with existing individual farm documentation and calculation obligations within the framework of the support system (e.g. Good Agricultural Practices);
- improved marketing profiles; and
- communication campaigns to disseminate project findings.

Main results

The OG actions resulted in an easy-to-use tool showing the sustainability, efficiency and environmental impacts of individual farms compared to others in Austria. Specifically, NEU.rind helped to:

- reduce by 88% (compared to the existing system) the working hours involved in assessing the sustainability, efficiency and environmental impact of a dairy farm;
- strengthen the competitiveness potential for approximately 23 000 dairy farms throughout Austria.
- provide farmers with a new digital toolkit for assessing sustainability, efficiency, and environmental impacts for farm-specific management;
- estimate potential improvement options from implementing farm-specific recommendations that enhance farm sustainability by reducing emissions or other environmental impacts;
- facilitate key figures that are easy to understand and can be generated for the individual farm.

Key lessons and recommendations

- Reducing methane and nitrous oxide emissions from dairy farms can significantly reduce global emissions from livestock.
- Digital twin models are useful virtual representations of an agrifood sector's lifecycle that can be updated relatively efficiently from real-time data to allow scenario simulation, machine learning and reasoning to help make decisions.
- The broad participation and cooperation of partners from agriculture, science, ministry and marketing ensured scientific correctness and good applicability in practice.

Additional information:

Project website:

www.rinderzucht.at/projekt/neu-rind.html