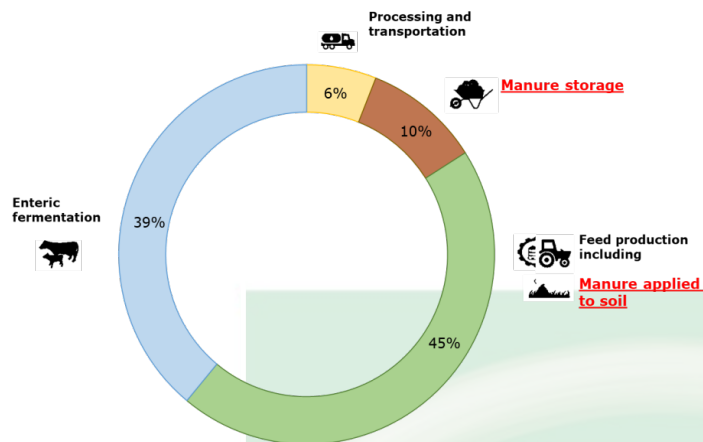


MELS – Mitigating Emissions from Livestock Systems

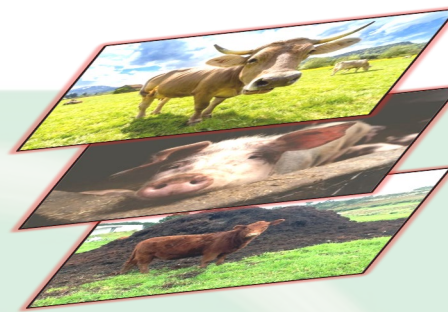


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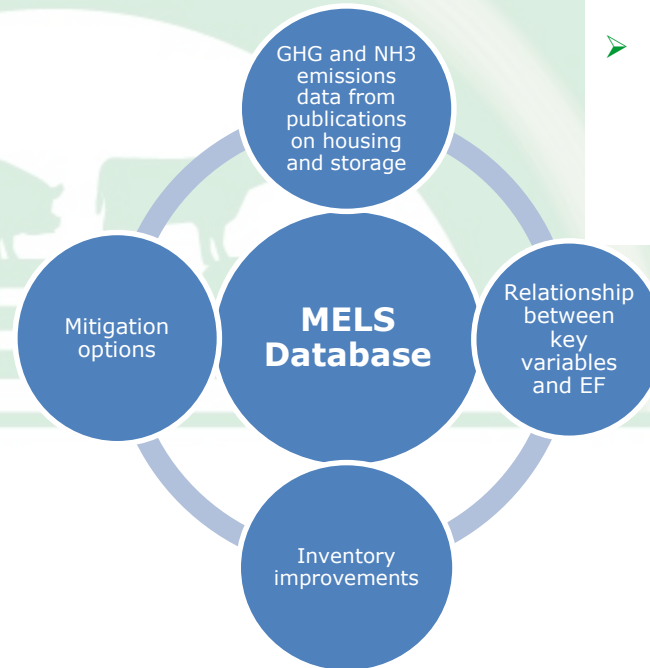
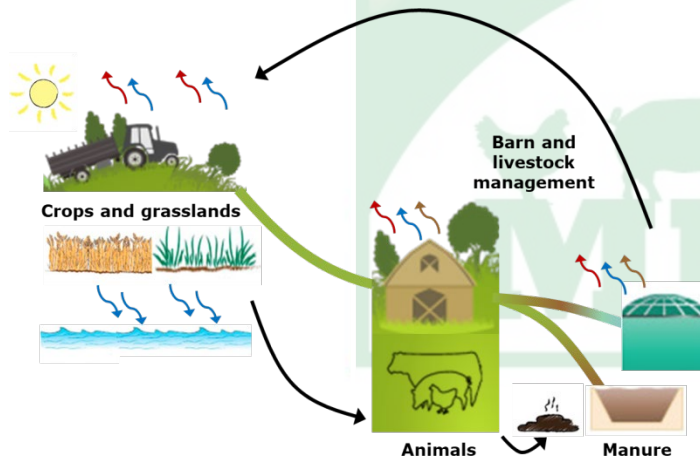
Adapted from Gerber et al. (2013)

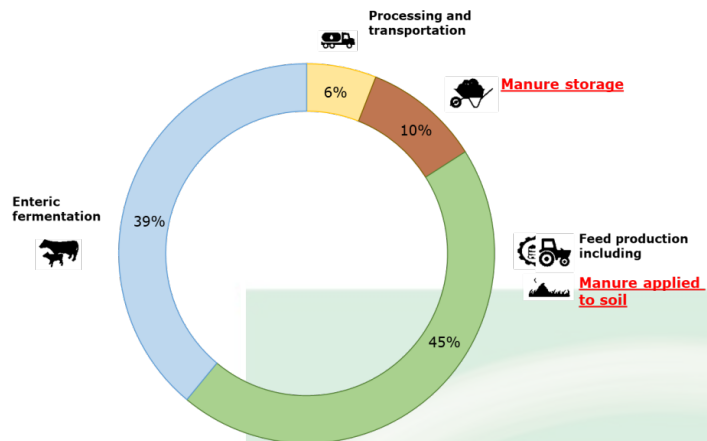
Data collation



- Collate GHG and NH₃ emission data and ancillary activity data across the entire manure management chain into a the unified database "DATAMAN"

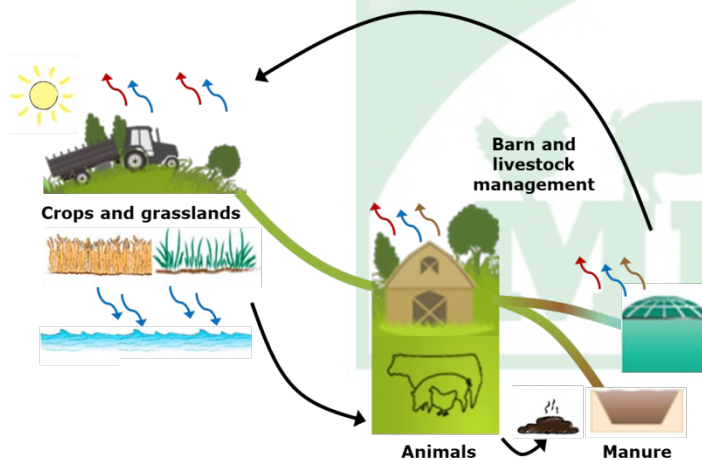
- Widen the geographical coverage of the database, adding data from Eastern and Southern Europe, Latin America, China



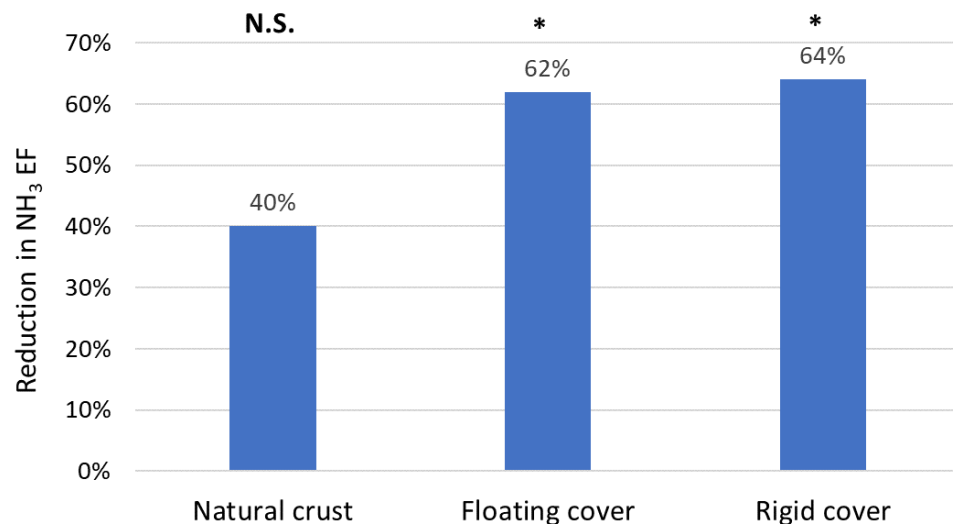


Adapted from Gerber et al. (2013)

Functional relationships



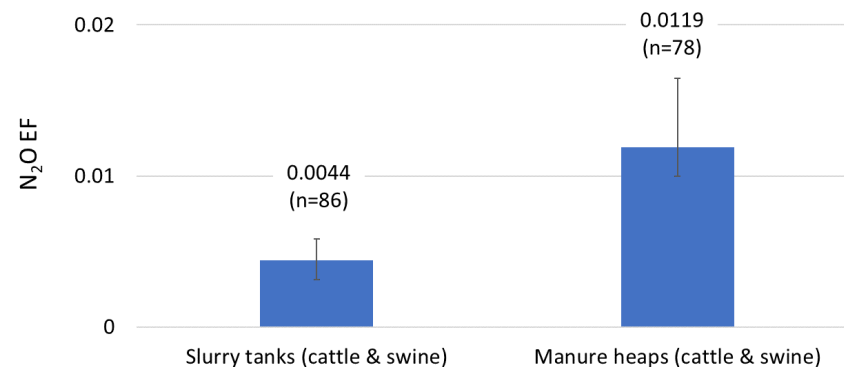
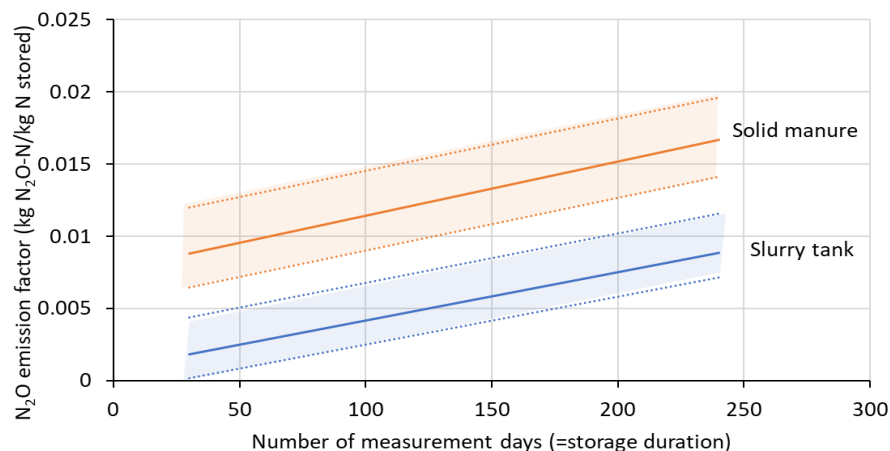
Functional relationships: some examples

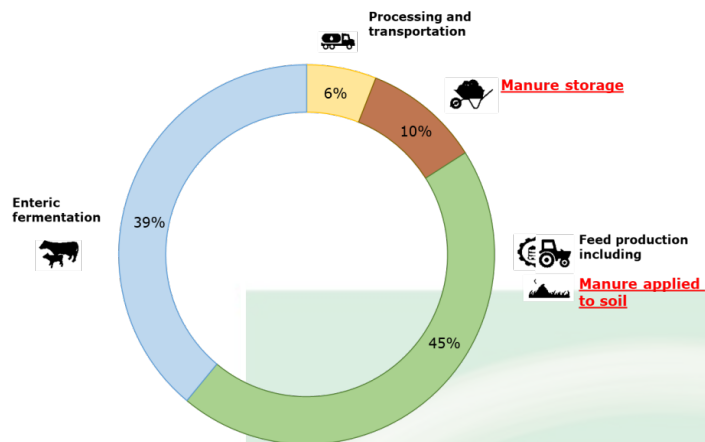


Ammonia: Slurry tank covers reduce cattle and swine emission factors (EF)

- Natural crusts reduce EF, but not significantly (crusts can sink when bubble formation ceases)
- Floating and rigid covers have similar effectiveness

Nitrous oxide: emissions from solid manure storage are consistently higher than those from slurry tanks, regardless of the storage duration



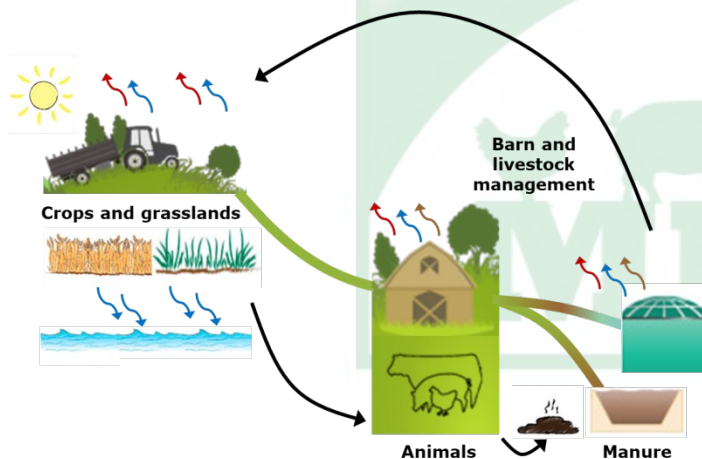


Adapted from Gerber et al. (2013)

Functional relationships



Stakeholder interaction



MELS – Improving national inventories and projections



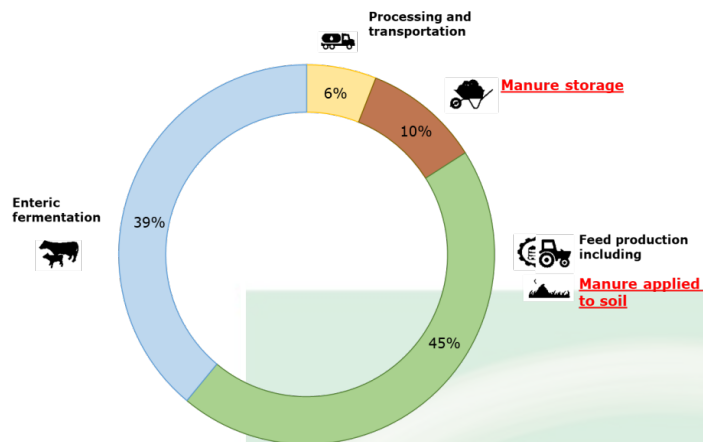
Aims:

- Improve accuracy and reportability of agricultural GHG and NH_3 emissions and of mitigation measures in National Inventory Reports
- Quantify the costs and benefits of mitigation measures in national inventories



- **Show at inventory level the effect of the mitigation measures taken at farm level**



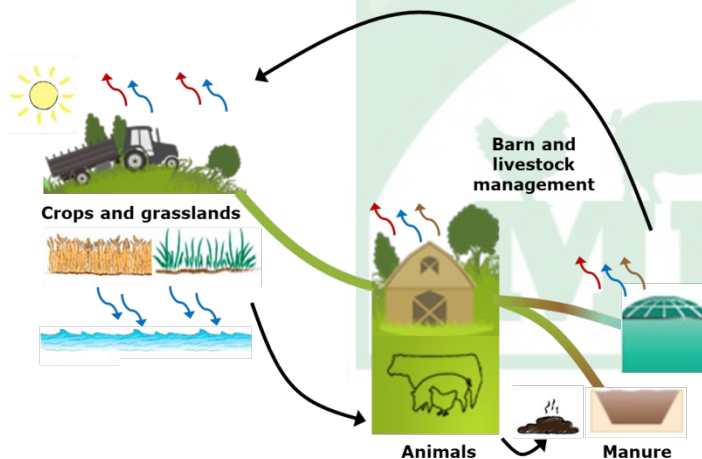


Adapted from Gerber et al. (2013)

Functional relationships



Stakeholder interaction



Farm-scale GHG DSS



United Nations
Climate Change

ipcc
INTERGOVERNMENTAL PANEL ON
climate change



Long-range Transboundary Air Pollution

Improved
national
inventories



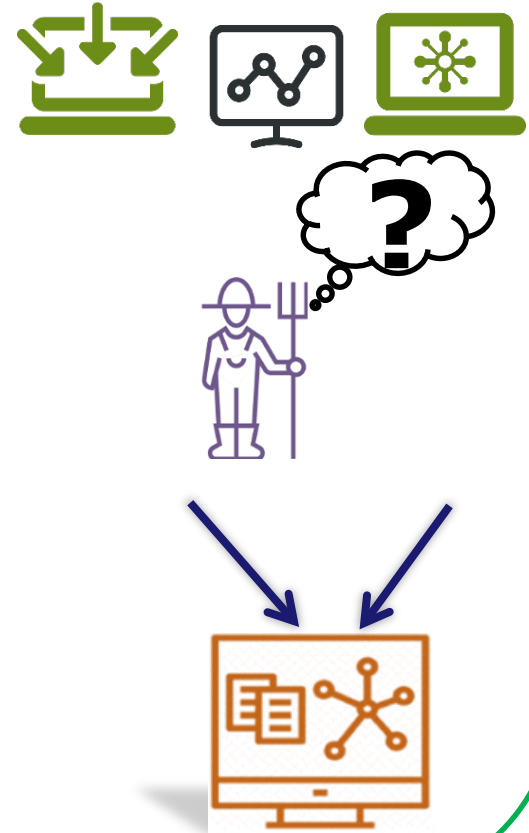
MELS - Farm-scale GHG DSS

Aims:

- Assess the future demands on farm-scale GHG DSSs, including the future role for ICT and sensor technologies
- Recommend improvements to GHG and cost calculations in existing farm-scale GHG DSSs



- **Help farmers to take informed and effective mitigation decisions at farm level**



MilKey: Decision support system for sustainable and GHG optimized milk production in key European areas



ΓΕΩΠΟΝΙΚΟ ΠΑΝΕΠΙΣΤΗΜΙΟ ΑΘΗΝΩΝ
AGRICULTURAL UNIVERSITY OF ATHENS



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Variability of Dairy Production Systems

Models from the partners



**Key parameter
definition**

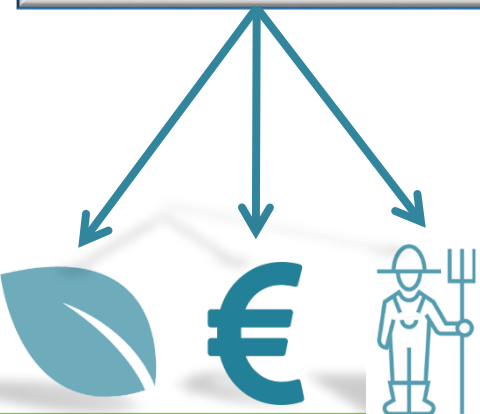
**Online
Monitoring
Tool**

**Data collation on Case
Study Farms**

**Sustainability
assessment**

MILKEY Platform

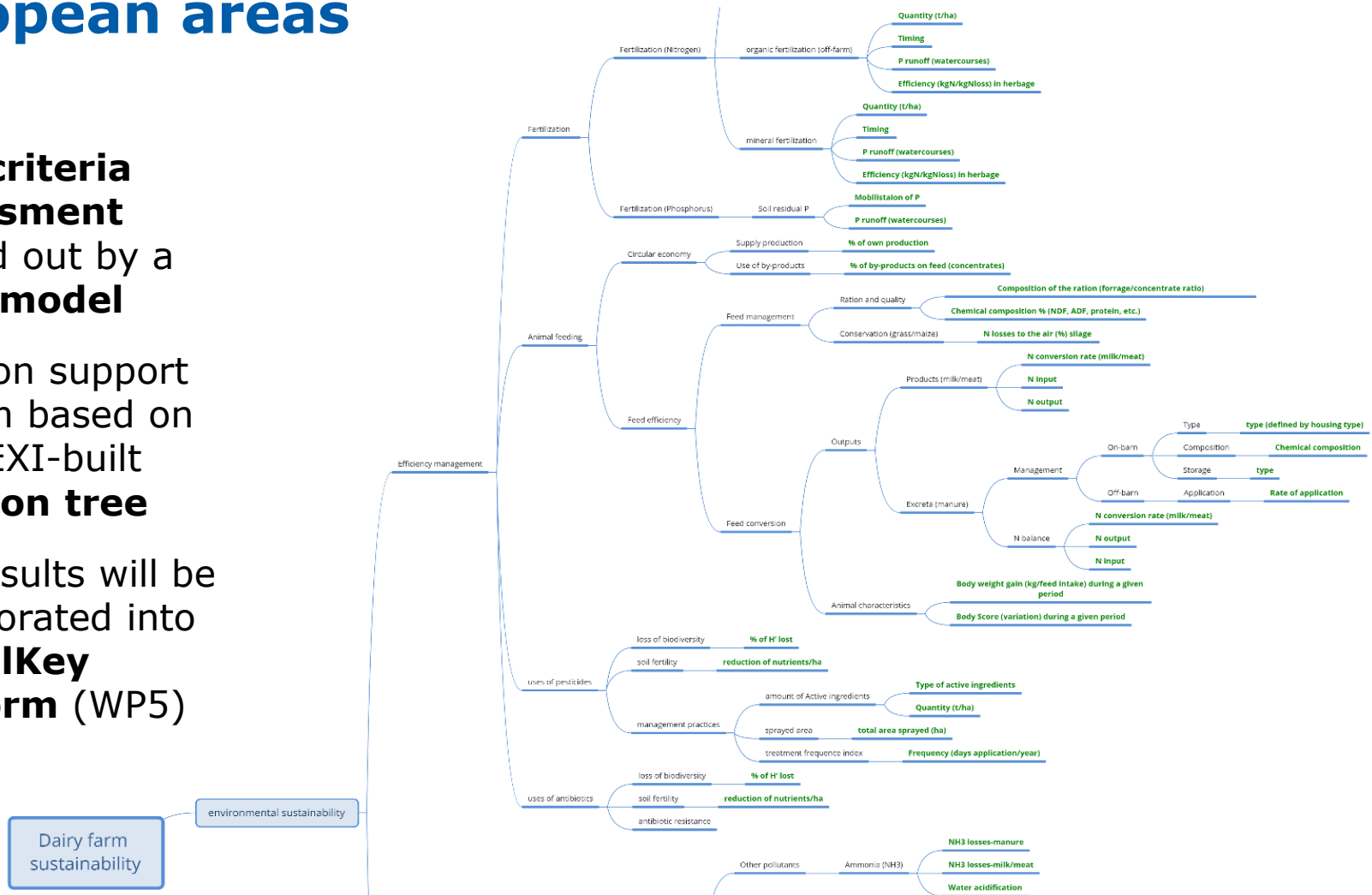
**Key challenges of the
sector**



3-pillar sustainability assessment and GHG mitigation potentials for key European areas



- **Multicriteria assessment** carried out by a **DEXI model**
- Decision support system based on the DEXI-built **decision tree**
- The results will be incorporated into the **MilKey platform** (WP5)



Variability of Dairy Production Systems

Models from the partners



Key parameter definition

Online Monitoring Tool

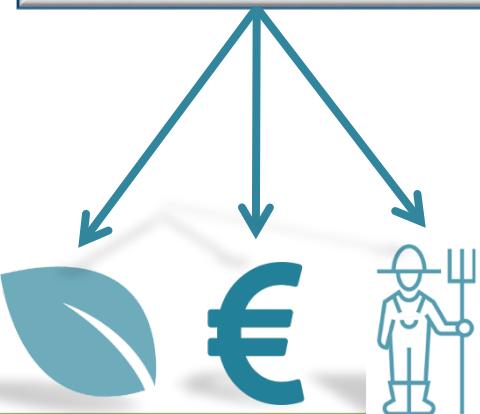
Data collation on Case Study Farms

Sustainability assessment

MILKEY Platform

Flexible concepts

Key challenges of the sector



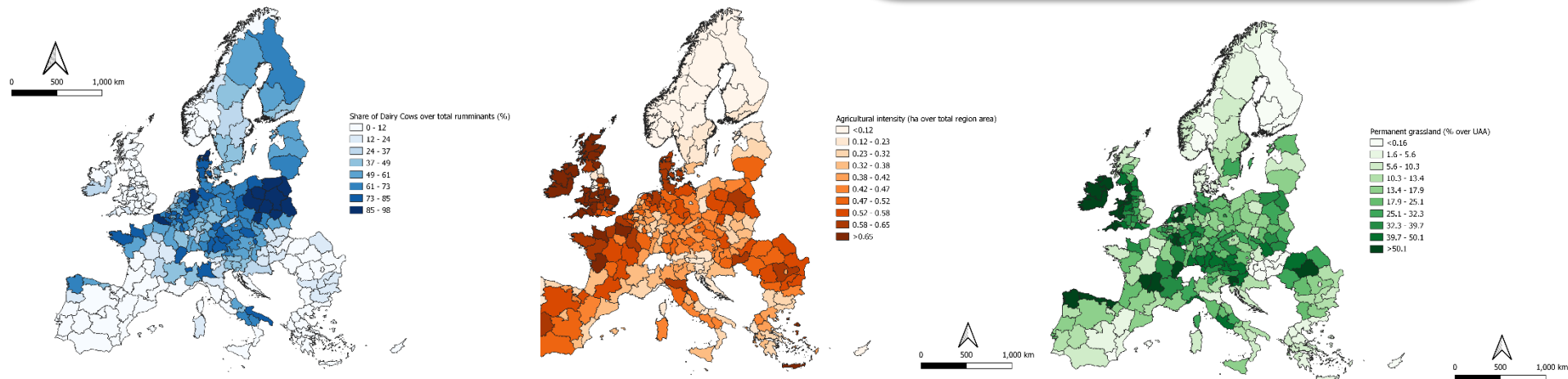
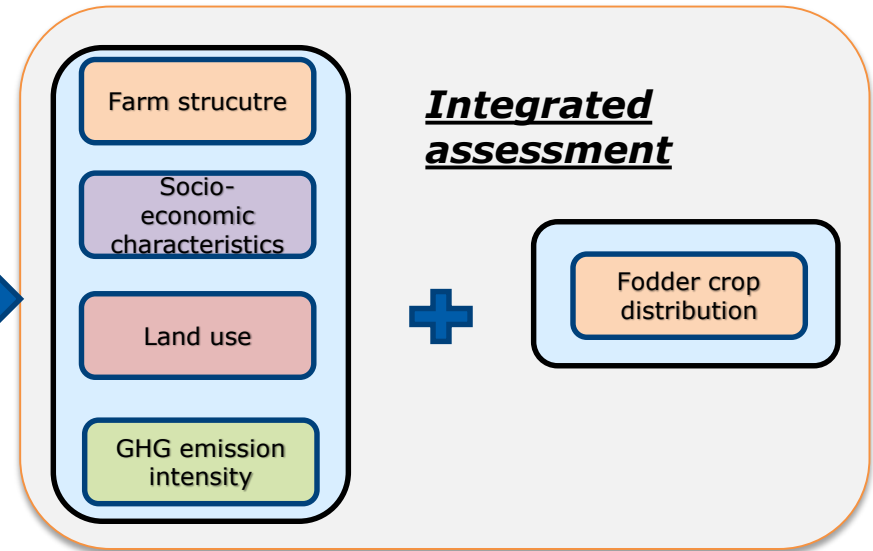
Integrated dairy-fodder crop production typologies

European milk and fodder crop production sectors are highly diverse



Representative typologies are needed for applying **adapted** and **tailored sustainability measures** at a European regional scale.

Based on

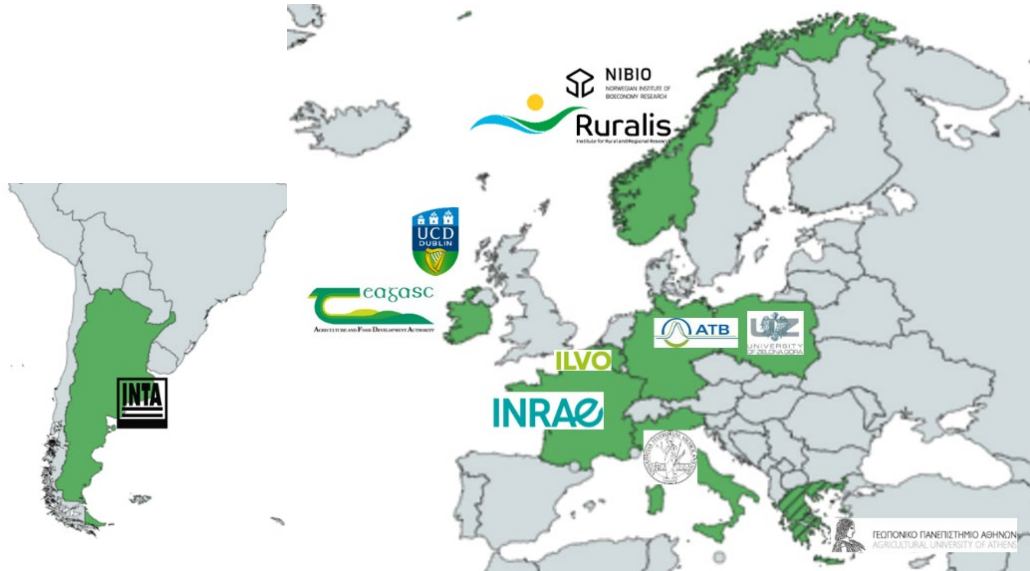


Follow-up project: DairyMix

➤ DairyMix is:



- modelling circularity and assessing multi-criteria sustainability of mixed farming systems for dairy production in Europe and Latin America (Argentina)
- updating/upgrading the MilKey online platform, including the evaluation of the effects of different farming practices (and different levels of crop-livestock integration) with regard to environmental, economic and societal sustainability indicators.



Project duration:
March 2022 –
March 2025

Continue the collaboration with TFRN

Continue the collaboration with TFRN

- Under the UNECE Convention on Long-Range Transboundary Air Pollution (Geneva Air Convention), the Task Force on Reactive Nitrogen (TFRN) has developed the “Guidance Document on Integrated Sustainable Nitrogen Management.”
- The Expert Panel on Mitigation of Agricultural Nitrogen (EPMAN)
 - Contributes to updates of the code of good practice for reducing ammonia emissions
 - Contributes to the review of the Gothenburg Protocol (shall be finalized Dec 2022)
 - Review may or may not result in Protocol revision
 - Annex IX of the Gothenburg Protocol (mitigation measures) stayed unchanged in 2012 => status of mid-1990s!
 - Art. 10(4) explicitly specifies the need to “evaluate ammonia control measures and consider the need to revise Annex IX”