

LIFE DAIRYCLIM



LIFE14 CCM/BE/001187

Feeding strategies to decrease methane emissions and carbon footprint of dairy cows in Belgium, Luxembourg and Denmark

COORDINATOR



INVOLVED PARTNERS





Background

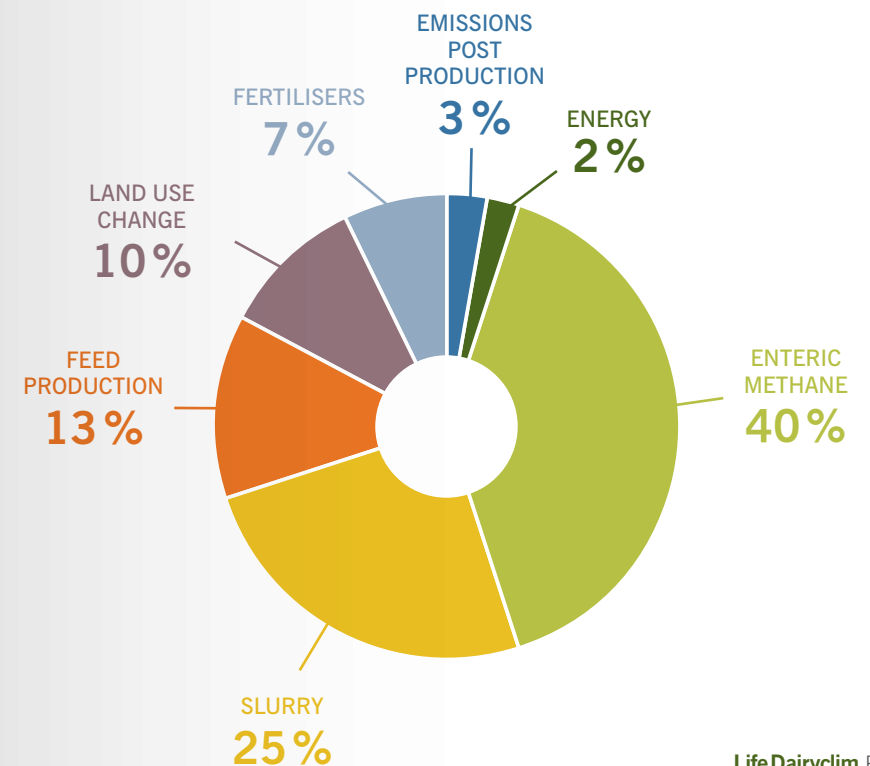
The increase in greenhouse gases (GHG) concentration in the atmosphere is one of the factors responsible of the global warming.

The impact of the agricultural sector on the total anthropic greenhouse gases (GHG) emissions is estimated at **14%** (Tubiello et al., 2015).

Different GHG are emitted by the sector: methane, nitrous oxide (N₂O) and carbon dioxide (CO₂).

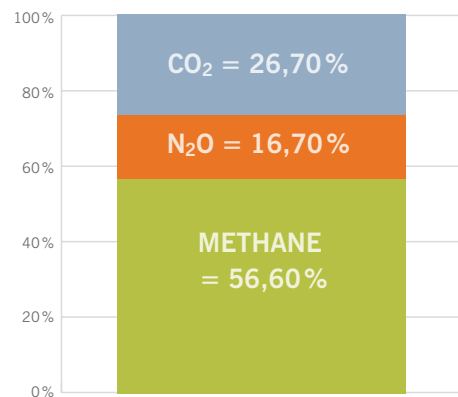
Methane represents on average **40%** of agriculture GHG emissions. It is produced mainly during ruminal fermentation.

Inventory of the different GHG emitted from agriculture

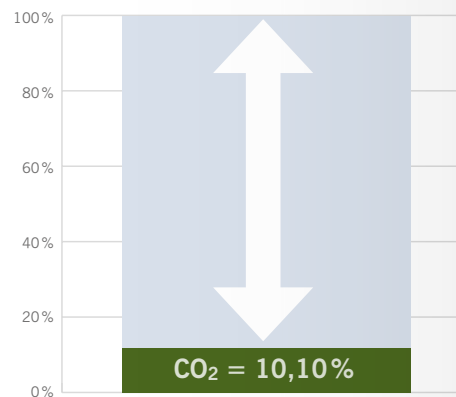


A proportion of GHG emissions can be mitigated by **the carbon sinking potential of permanent grasslands**

Proportion of the different GHG estimated in a pilot farm of the project



Proportion of CO₂ sunk in permanent pastures



Well conducted grazing contributes to grasslands preservation



Aims of the project

- **Decrease enteric methane emissions** of dairy cows by proposing adapted feeding strategies in the 3 participating countries.
- Contribute to the conservation of grasslands by **highlighting the carbon sinking potential** of permanent grasslands and improving grazing management.
- **Ensure the dissemination and the transferability** of the results of the project.

Actions carried out in the project to complete these objectives

- Overview of grazing practices in the three countries through surveys addressed to dairy farmers.
- Feeding trials during winter and summer.
- Implementation of best feeding strategies in pilot farms.
- Dissemination of the outcomes of the project.

To complete these actions, 5 partners and 3 countries

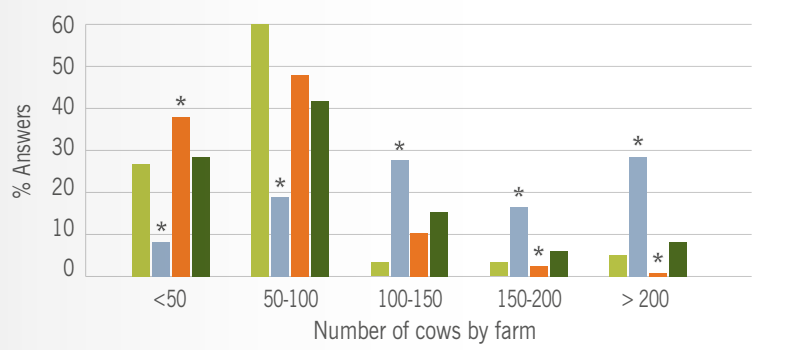
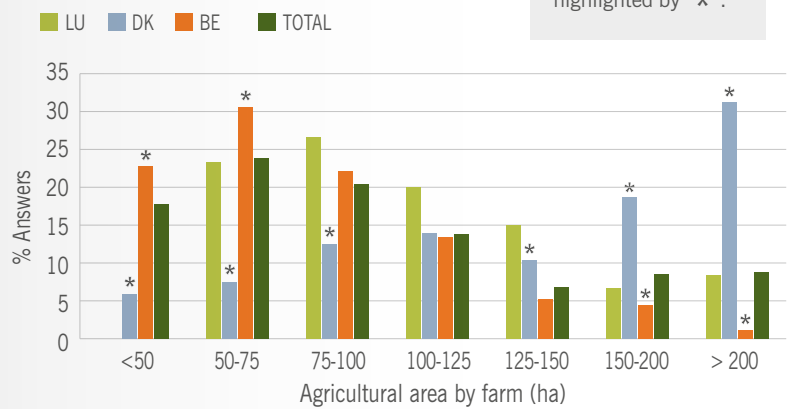


Overview of grazing practices in the three countries through surveys

The size of dairy farms was very different among the participating countries: Danish farms were larger in terms of area and number of cows.

Agricultural areas of dairy farms and number of dairy cows per farm in the three participating countries.

Significantly different values are highlighted by “*”.



Percentage of grazing farms following the countries.
The larger the dairy farm, the lower percentage of grazing cows.

83% in Luxembourg 37% in Denmark 95% in Belgium 80% average 3 countries

Feeding trials during winter

- The **component to be tested** was added to the usual diet of dairy cows.
- **4 components** were tested during the 2 first years of the project.
- They differed in composition:
 - rich in **fat** or in **starch**
 - extruded **linseed** or **rapeseed**.
- **Methane emissions and environmental impacts** were assessed and compared with a control.



The component is given in an automatic concentrate supplier. When the cow comes to eat, she is recognised by her eartag. While she eats, methane emissions are measured in her breath every 3 seconds.



The tested component is given as a supplement of the usual ration.



Methane is also estimated in milk samples using an equation developed at the University of Liège and CRAw.

Implementation of best feeding strategies in pilot farms

Best feeding strategies were implemented in **8 pilot farms** in the participating countries.

Methane emissions, **environmental** impact and **zotechnic** parameters (milk yield and composition) were monitored during the implementation phase.



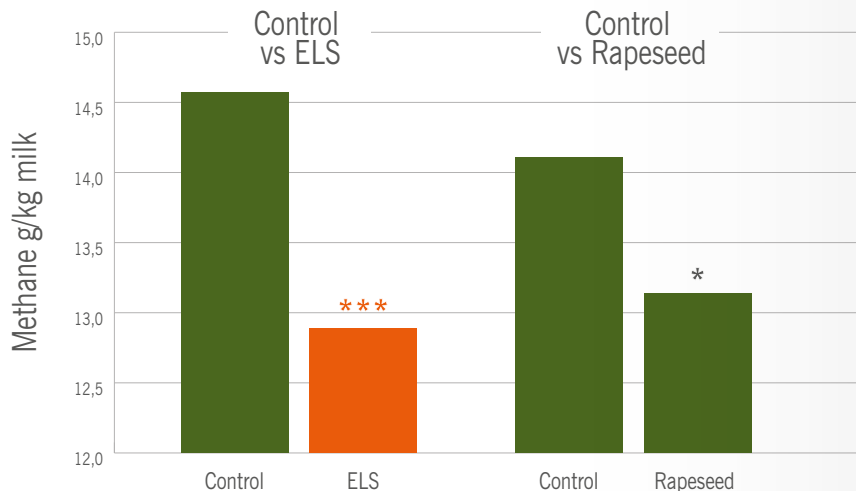
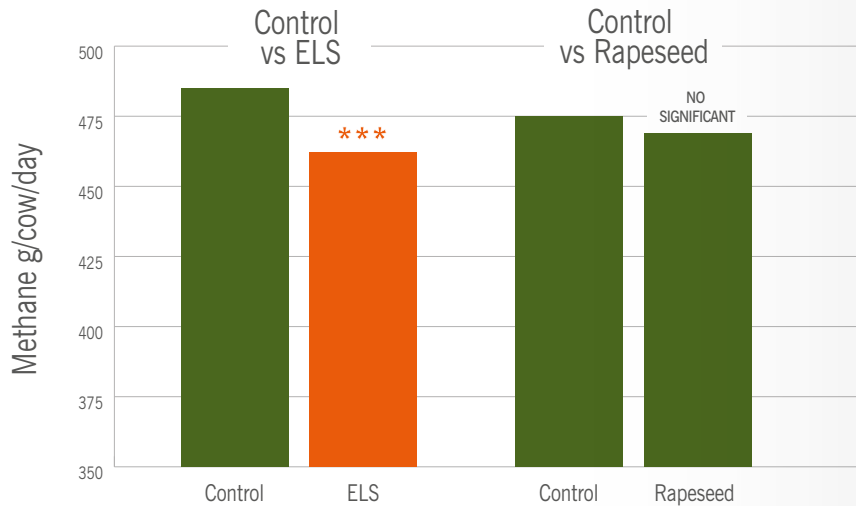
Meeting in a pilot farm to explain the feeding strategies to implement.



Installation on farm to measure methane in breath samples.

Results

The target was a decrease **by 10% of methane emissions**. This objective was reached with **extruded linseed (ELS)**.



47% of farmers reported stopping grazing due to difficult management.

Make grazing management easier

In the project LIFE-Dairyrim, we used precision grazing tools to **make it easier**.

We used **connected rising platemeters**.

These devices allow to estimate the grass available on pasture and to calculate grass stocks.

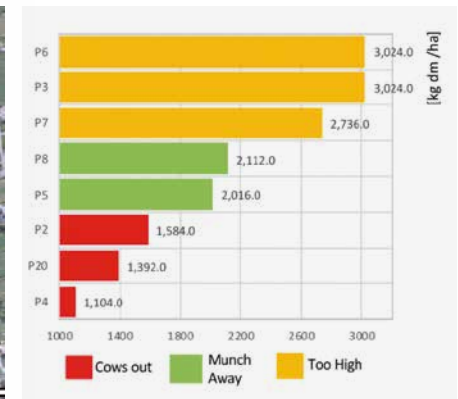
Each grass height measurement is identified and a decision-supporting graph is edited.



Connected rising platometer.



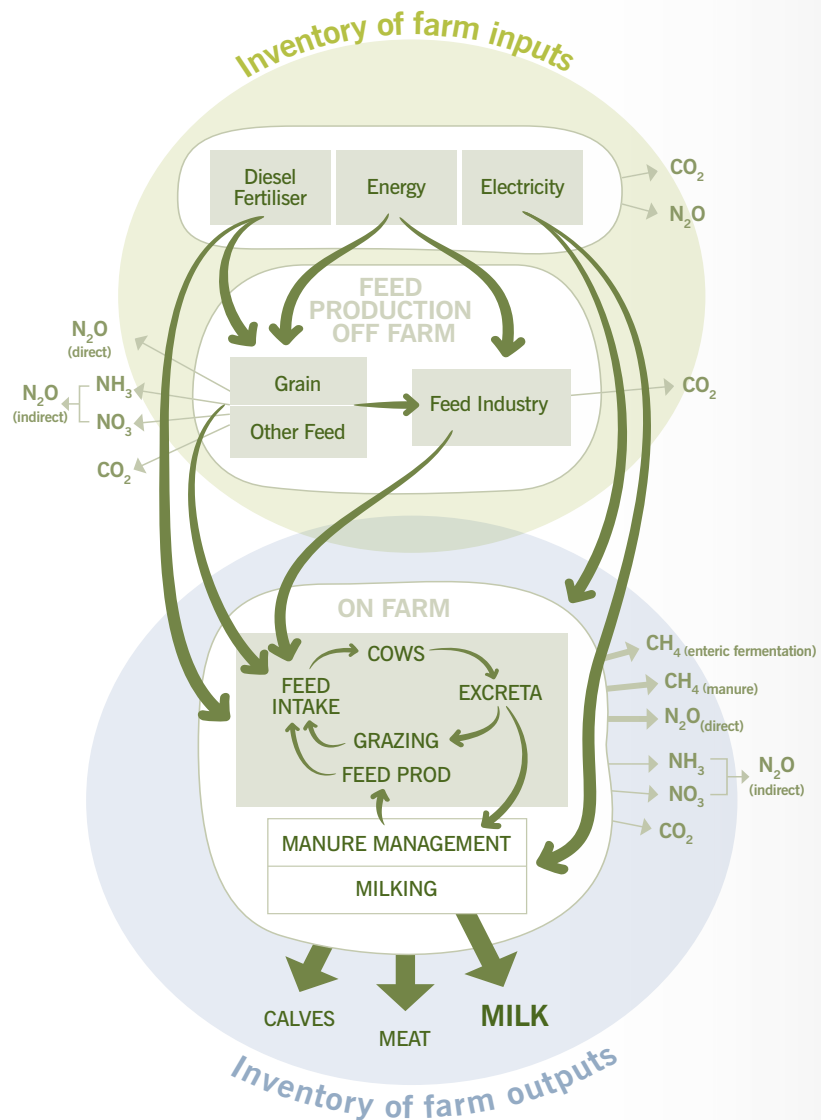
Identification of each measurement.



A decision-supporting graph.

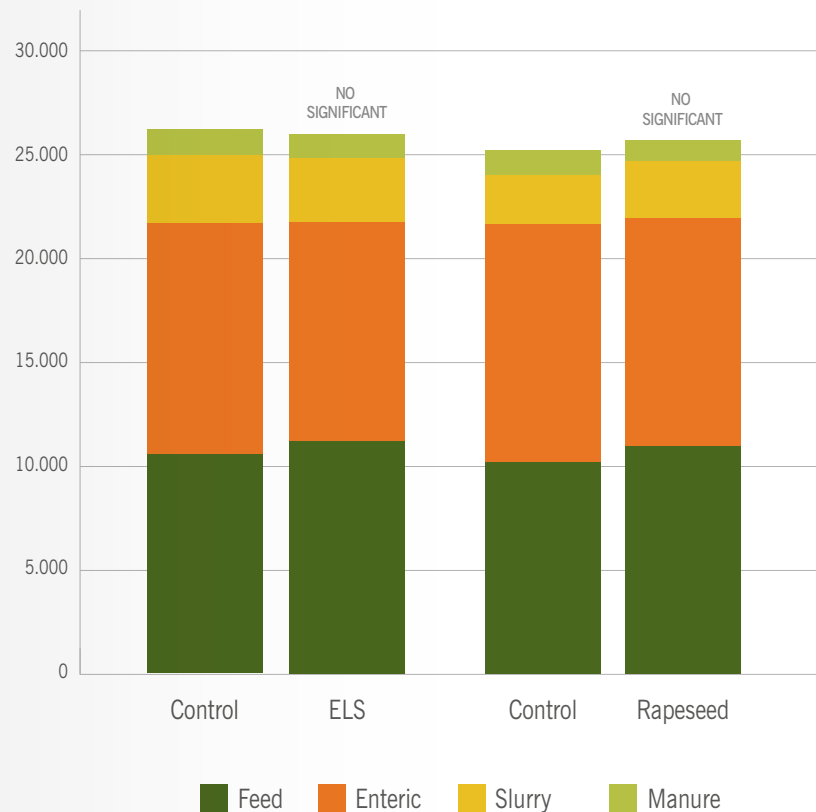
Evaluation of the environmental impact

Life cycle assessment from cradle to farm gate



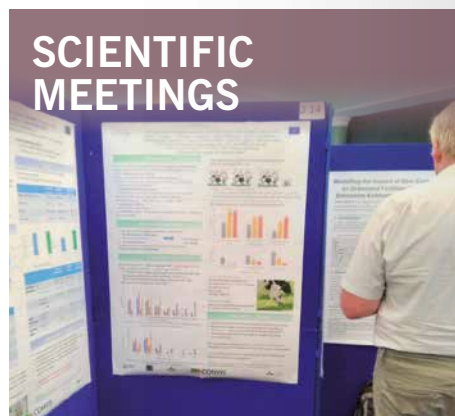
Based on Flysjö et al. (2011)

Environmental impact of each GHG sources (gCO₂ eq)



The relative contribution of GHG emissions was estimated:
Use of different components did not demonstrate any negative impact on environment.

Dissemination of the outcomes of the project



More information?

<http://labos.ulg.ac.be/dairyrim/>

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<https://www.youtube.com/watch?v=rq2yFmKSGEY>

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