Development of Mitigation Engine for specialized dairy farms

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Climate neutrality and Net-zero emissions

- Talks at companies and European Commission
- EU projects are about it
- Climate neutrality & Net-zero?
- Efforts have been initiated but far from Climate neutrality & Net-zero
- Which strategies?
    - Emission Reduction
    - Renewable Energy
    - Technological Innovation
    - Carbon Sequestration

Steps for emission reduction

Monitoring GHG emissions

- Inventory (primary and secondary data)
- Tool (Cool Farm Tool, country specific tools, KLW, CAP'2ER)

Check

Comparison with the company/national goals

- If achieved, continue monitoring
- If not, go for mitigation strategies

Act

Using decision support tools

- Dairy Wise, Mitigation Engine, MethaneMonitor, GLEAM, etc.

Plan

Implementation

- Practical guidance

Do

Need for Mitigation Engine?

- Dairy is a complex production system
- Interactions between the production factors
- The impacts of a measure are very complex
    - Change in grazing
    - change in ration (impact on both feed and milk production)
- GHG reduction potential for farm specific conditions

Therefore: a **comprehensive** view is needed!

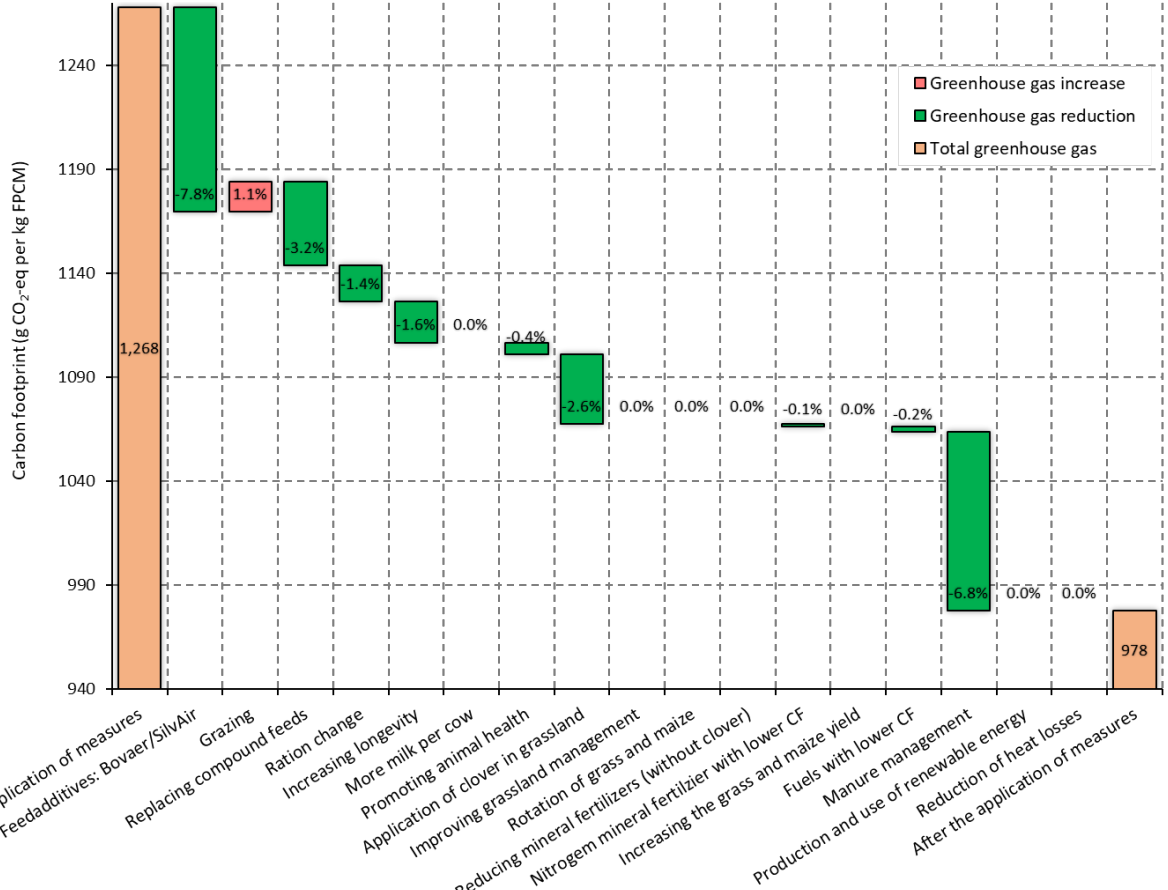
Advantages of Mitigation Engine

- Farm-specific model: connected to a monitoring tool (KLW/ANCA tool)
- Metamodel: uses results of other models in a simplified form
- Applied LCA approach
- Considers the interactions
- User can see the impacts of measures
- Updatable easily
- User friendliness

List of measures in Mitigation Engine

- **Feeding related measures:**
  - Application of feedaditives (Bovaer and SilvAir)
  - Grazing
  - Compound feed adjustment
  - Diet adjustment
- **Animal management related measures:**
  - Increasing longevity
  - Increasing productivity (milk per animal)
  - Improving animal health
- **Manure management related measures:**
  - Regular emptying manure storage
  - Primary separation
  - Digester
- **Land management related measures:**
  - Clover on grasslands
  - Grassland management
  - Rotation of grass-maize
  - Less application of mineral fertilizers
  - Nitrogen fertilizer with low carbon footprint
  - Increasing grass and maize yield
  - Use of diesel fuel with low carbon footprint
- **Energy related measures:**
  - Production and use of renewable energies
  - Reduction of energy losses

Use of Mitigation Engine



Take home message

- Supporting farmer is key toward climate neutrality or net zero
  - Research and development initiatives
  - Technical assistance programs
  - Financial incentives
- Co-benefits and trade-offs
  - Environmental (Air, Soil, Water)
  - Ecological (Biodiversity, Landscape, Land use)
  - Economic (Input, Outputs, Technology)
  - Institutional
  - Public and private costs
  - Societal (Animal health, Food security, Public health)

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Thanks for your attention!

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