INNO Mil-CH_4
GHG Emissions from Milk Production

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Research Questions

Is it possible to mitigate GHG emissions from a dairy farm by modifying the diet?
What is the potential of the basal diet and dietary fat sources to reduce methane emission of cows?

Introduction

Analysis of the relationship between dairy cow diets and GHG emissions from enteric fermentation and excrements at laboratory and field scale

Methods

- Monitoring of GHG emissions (CH_4) from enteric fermentation of 20 cows in respiration chambers fed with four different diets
- Determining the biogas yield and quality of the excrements (according to VDI-Guideline 4630) representing the CH_4 emission potential
- Collection of data on diets, manure management and milk production from 21 farms located in three regions of Germany
- Development of a model for the calculation of GHG emissions at farm scale

Preliminary Results

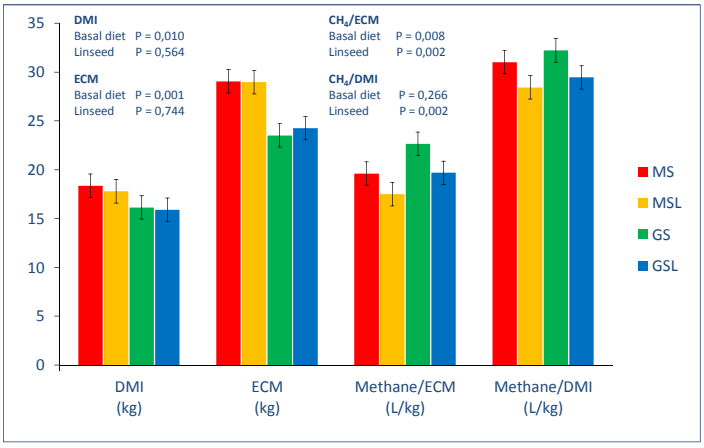

Fig. 1. Performance and methane emission data (10 cows/diet) with 4 diets (diets: MS, maize silage-based; MSL, MS + linseed; GS, grass silage; GSL, GS + linseed; LSM ± SE)

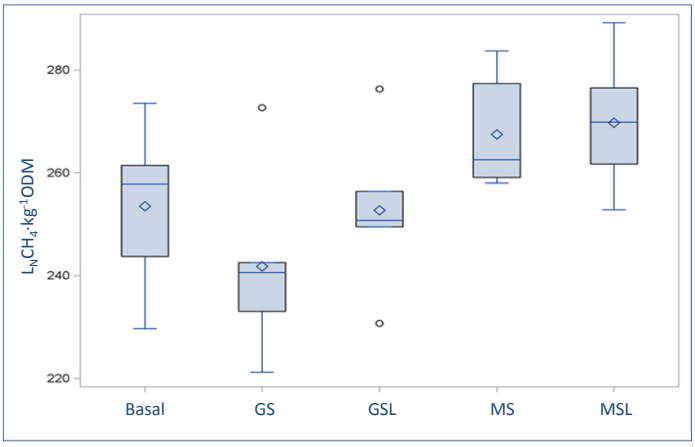

Fig. 2. Methane emission ($L_NCH_4 \cdot kg^{-1}ODM$) from the excrements produced by dairy cows fed with 5 diets (basal diet and see legend Fig. 1)

Next steps

- Complete balance of emitted GHG (CH_4 and N_2O) at farm scale through the validated mathematical model
- Improving of the CH_4 estimation model based on the fatty acid pattern of the produced milk