RELATIONSHIPS BETWEEN METHANE EMISSIONS OF DAIRY CATTLE AND FARM MANAGEMENT

M.-L. Vanrobays[1], A. Vanlierde[2], P.B. Kandel[1], E. Froidmont[3], F. Dehareng[2], H. Soyeurt[1,4] & N. Gengler[1,4]

[1] Animal Science Unit, Gembloux Agro-Bio Tech, University of Liège, B-5030 Gembloux, Belgium
[2] Valorisation of Agricultural Products Department, Walloon Agricultural Research Centre, B-5030 Gembloux, Belgium
[3] Department of Production and Sectors, Walloon Agricultural Research Centre, B-5030 Gembloux, Belgium
[4] National Fund for Scientific Research, B-1000 Brussels, Belgium

OBJECTIVE

Using fine milk composition obtained from mid-infrared (**MIR**) spectral data to **improve management** of dairy herds allowing **mitigation CH_4 emissions** from Walloon dairy cows

CONTEXT

The dairy sector is considered as a large contributor to global greenhouse gas emissions, predominately due to anthropogenic methane (**CH_4**) emissions from enteric fermentation by ruminants (FAO, 2010). Moreover, these emissions also represent major losses of energy for dairy cows (from 2% to 12% of gross energy intake; Johnson & Johnson, 1995). So, in order to improve the sustainability performance of dairy farming, it appears necessary to identify different approaches to mitigate CH_4 emissions of dairy cows.

RESEARCH PLAN

- Prediction of individual CH_4 emissions of dairy cows
  - **Predictive equations** of CH_4 production
    - based on equations from the **literature** (e.g., Chilliard *et al.*, 2009 ; Dijkstra *et al.*, 2011)
      - From prediction of **fatty acids** contents in milk by MIR spectrometry (Soyeurt *et al.*, 2011)
    - developed through the MethaMilk project
      - From **milk MIR spectra**

➢ **Applying** these equations on the spectral database of the Walloon Region of Belgium

- Relationships between **predicted CH_4 emissions** and **farm management**
  - Study of the **evolution** of CH_4 production in the Walloon Region of Belgium
    - Assessment of the influence of factors related to farm management (e.g., environment, nutrition)
  - Study of the **variation** of CH_4 emissions
    - morning/evening milk, throughout lactation, lactation number, *etc.*

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CONTACT: mlvanrobays@ulg.ac.be