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Relationships between methane emissions from dairy cows and farm technico-economic results

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Background

- Interest in mitigating enteric methane (CH_4) emissions from cows because of:
  - contribution to climate change
  - loss of 2-12% of gross energy
- Many studies on CH_4 determining factors but few studies on a large scale and with on-farm data
- Few studies linking enteric CH_4 to profitability

Objectives:

Investigating relationships between enteric CH_4 (g/day) and :

- technical practices
- economic results

on commercial dairy farms

Materials and Methods

- 525,697 individual CH_4 records predicted from milk mid-infrared spectra ➔ herd*year based CH_4 proxy (g/day)

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- 1,024 accounting sheets (technical and economic data)

  〓 1,024 herd*year records from 2007 to 2015

- Correlations and ANOVA to identify variables associated with CH_4

Conclusion:

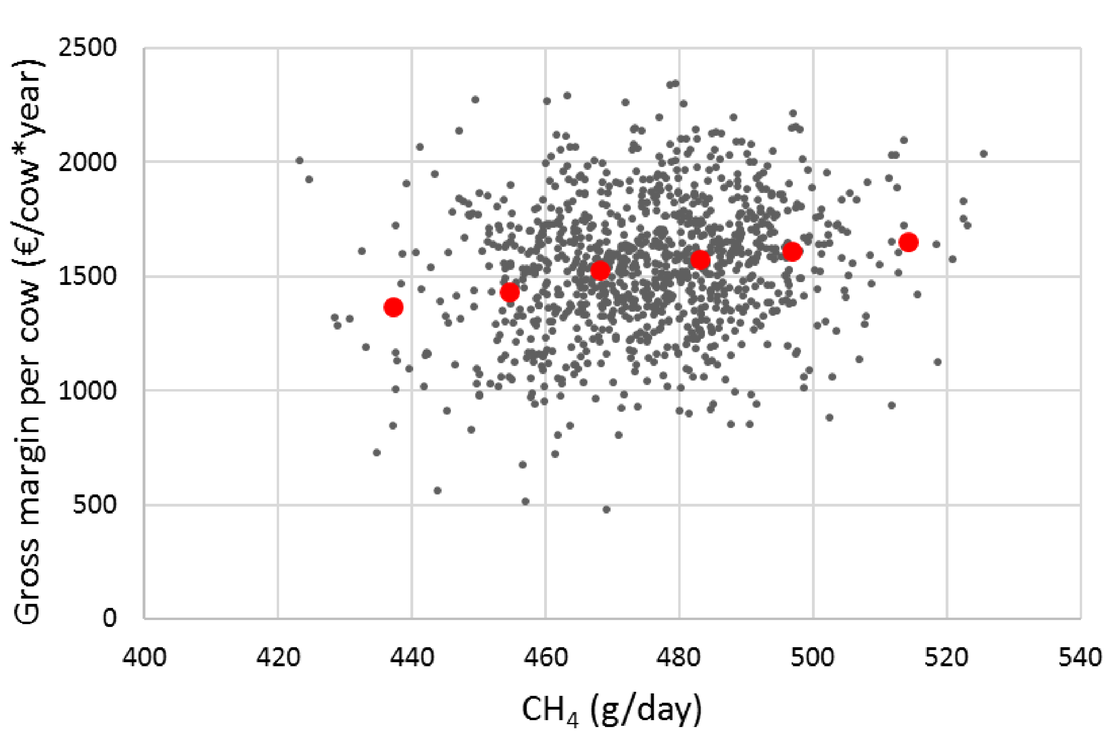
- Large variability in technical and management practices for herds with similar CH_4 emissions
- Tendency to less optimal technical practices and lower economic results for herds producing less CH_4

Results

- Correlations (r) between CH_4 and some relevant technical variables (p-value < 0.05)

Variable	r
Size of the forage area (ha)	-0.14
Nitrogen applied on grasslands (kg/ha)	0.15
Number of livestock unit per ha (LU/ha)	0.07
Milk fat content (%)	0.38
Milk protein content (%)	0.33
Fat and protein corrected milk yield (L/cow*year)	0.18
Milk solids (kg/cow*year)	0.20
Milk produced from forages (L/cow*year)	0.12
Milk produced from fresh grass (L/cow*year)	0.09
Replacement rate (%)	-0.15
Calving interval (day)	-0.21
Age at first calving (day)	-0.09

- Gross margin per cow *VS.* CH_4 (red dots represent the gross margin LS-means for 6 groups of herds based on CH_4)



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