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First assessment of methane emission in Mediterranean Buffaloes with a smart tool: preliminary tool

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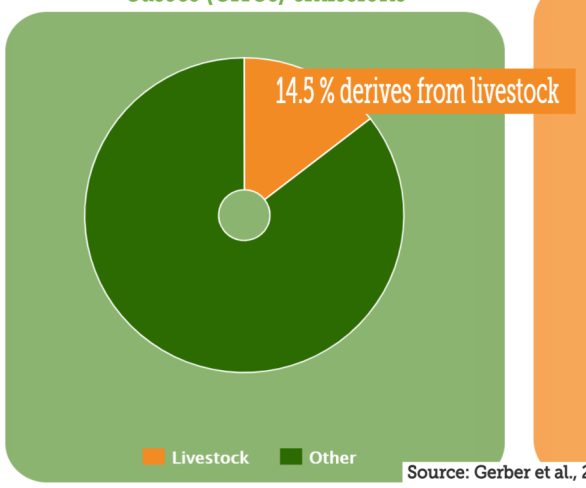
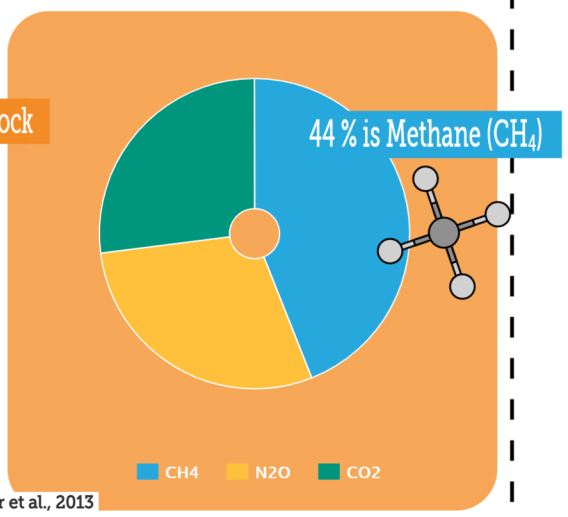
FACTS

Global anthropogenic Greenhouse Gasses (GHGs) emissions



Distribution of livestock emissions



Source: Gerber et al., 2013

Innovative approaches are needed to quantify the emissions from different ruminant species directly on farm to help determine optimal mitigation solutions.

Portable smart tools have a big role to play

The laser methane detector (LMD)

- **it is a hand-held device to measure CH4 from animals in a non-invasive way and in their natural conditions**
- **its use in livestock was first. reported by Chagunda et al., 2009**

The aim of the current study was to assess the application of the LMD in measuring CH4 emissions in Italian Mediterranean Buffaloes (IMB) and to explore possible animal and environmental factors that could influence the measurement.

MATERIALS AND METHODS

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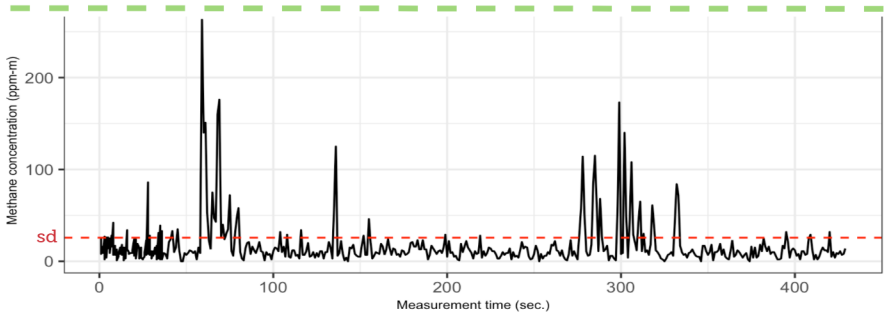
20 adult non-productive buffaloes
Fed with a low input diet (F:C = 80:20)

Weight estimation
Equation used: Khan et al., 1978



LMD output data were divided for each day and each subject into **eructation/peak CH_4 (CH_E)** and **breathing/basal CH_4 (CH_B).**

LMD measurements
12 consecutive days in **summer**
4 minutes for each measurement
Animals **standing idle**
No physical restrain

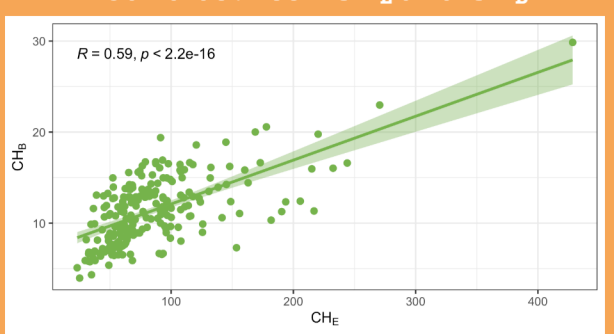
Daily Temperature Humidity Index (THI)
Equation used: NRC, 1971

A linear mixed model and Person's cofficient were used to analyze the effect and correlations of the variables

CH_E
84.3±42.6 ppm-m

RESULTS AND DISCUSSION

A significant positive correlation was found between CH_E and CH_B



CH_B
11.4±3.7 ppm-m

INDIVIDUAL VARIABILITY

A between-subject variation was observed for both CHE ($p<0.001$, $\varepsilon^2=0.12$) and CHB ($p<0.001$, $\varepsilon^2=0.21$)

not explained by

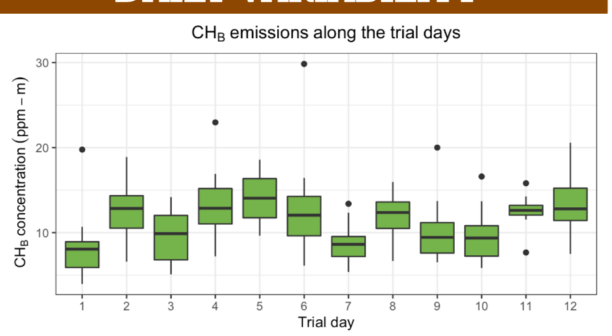
WEIGHT
412.2±39.1 kg

SEX

CONCLUSION

These preliminary results allow us to consider LMD measurements as biologically meaningful for IMB and indicate the need to build a robust protocol for measuring CH4 emissions in this species

DAILY VARIABILITY



Trial days significantly influenced CH_B ($p<0.001$)

while no effect was found on CH_E

not explained by

THI
74.5±1.8

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