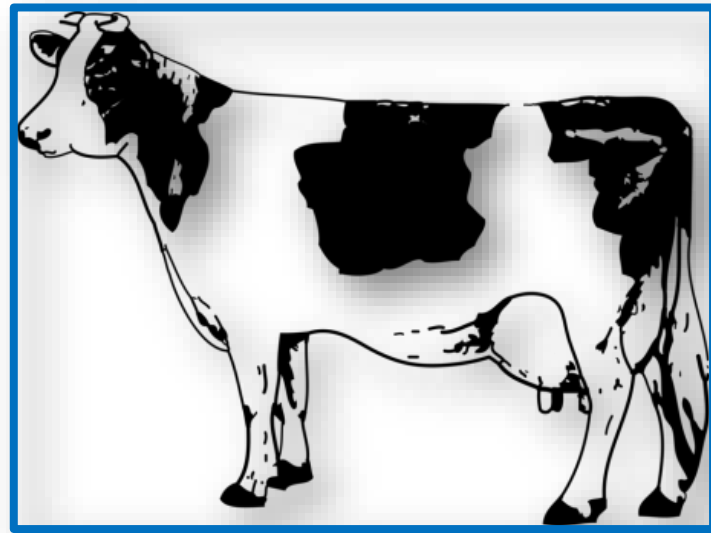




*Methane emissions in grazing dairy systems*

**Ben Lahart, Katie Starsmore, Jonathan Herron and Laurence Shalloo**

**Teagasc Research insights  
14<sup>th</sup> July, 2021**



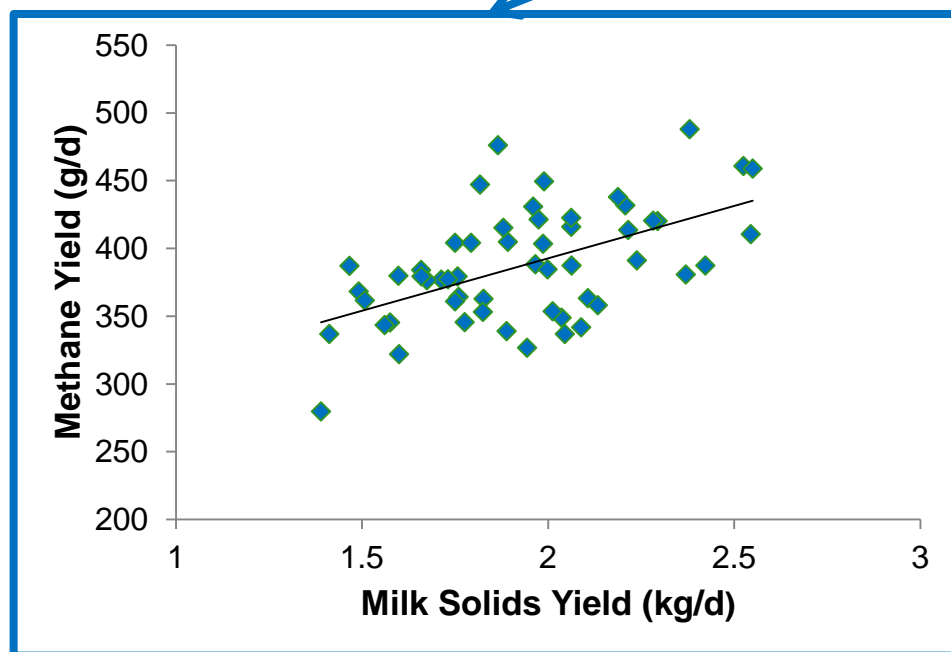
Animal factors



Sward factors

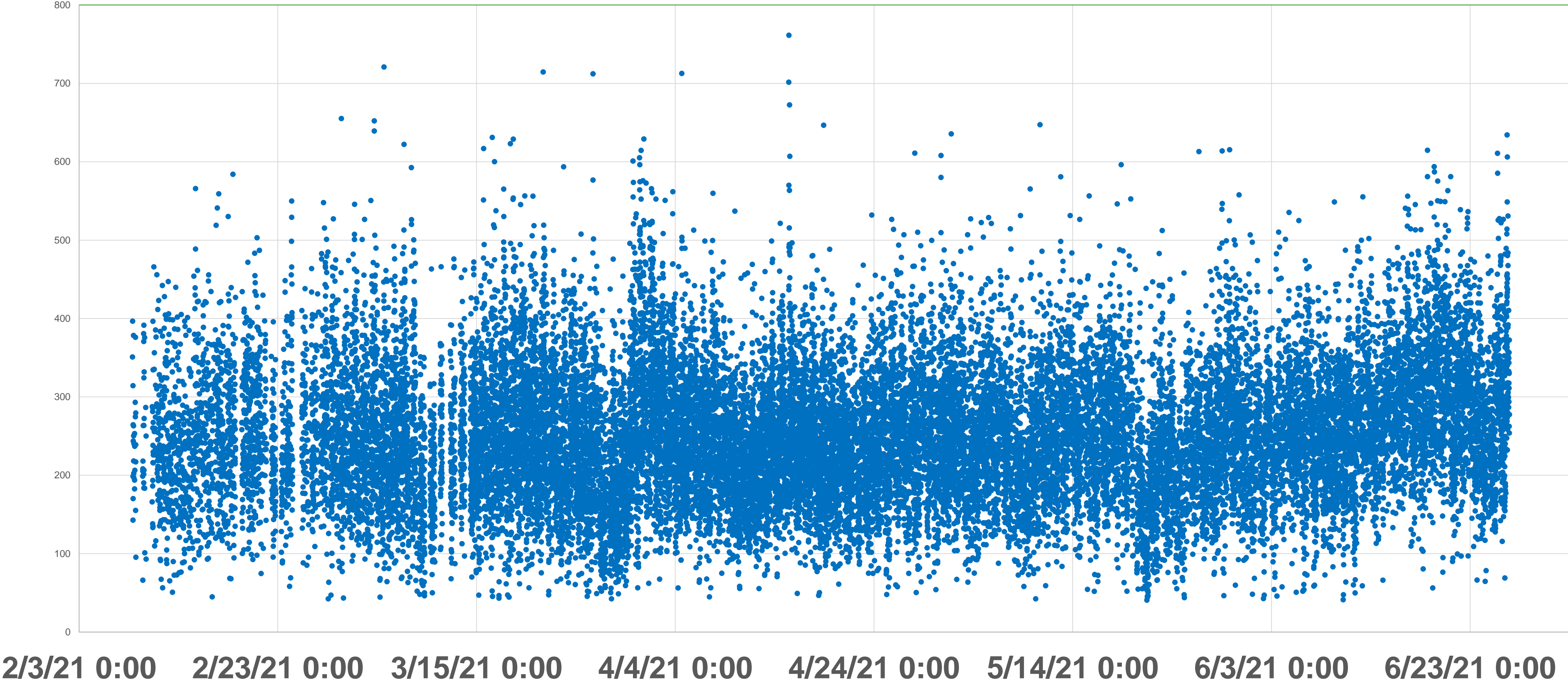


Feed additives

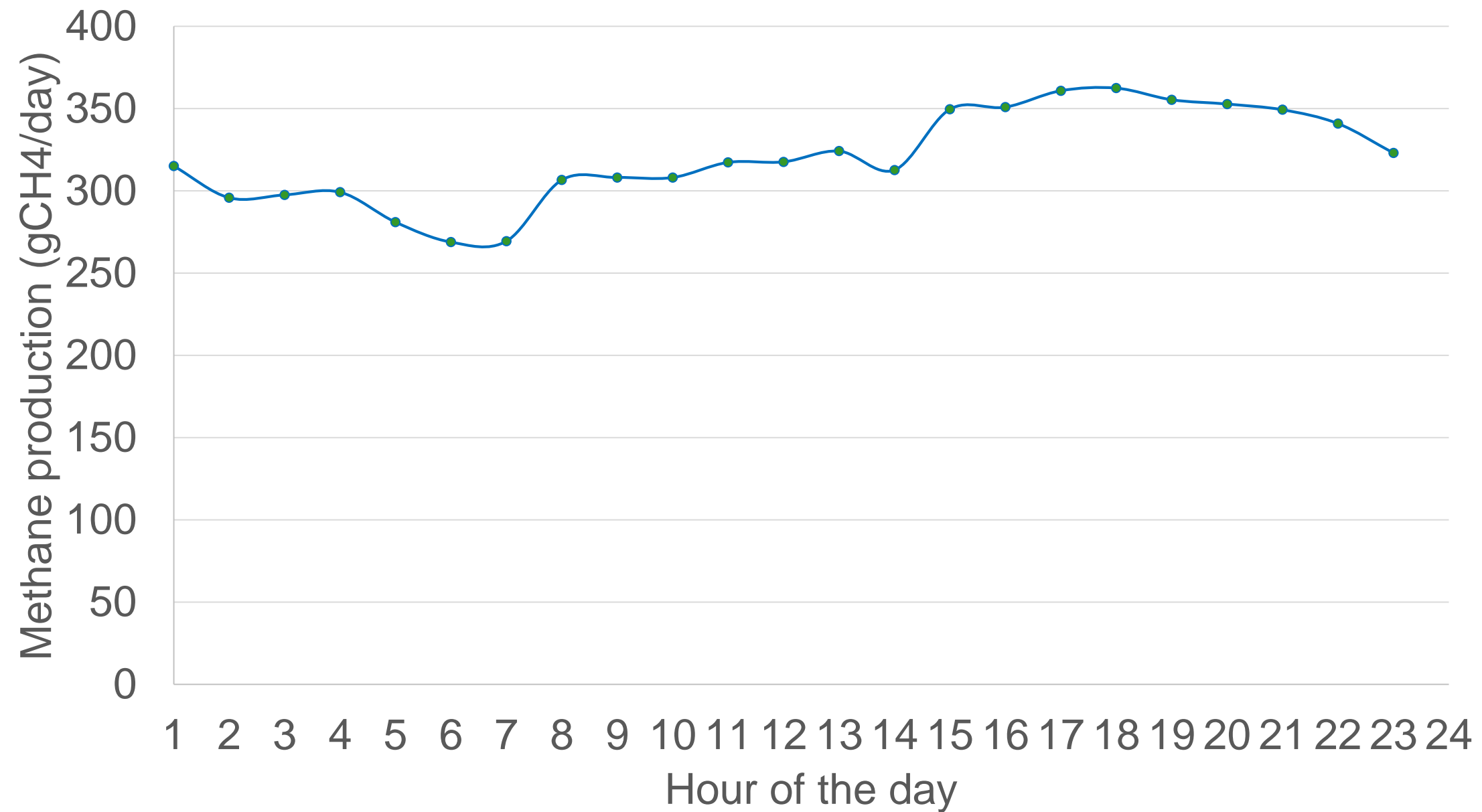


Prediction models

# Measurement profile 2021



## Diurnal pattern of methane production

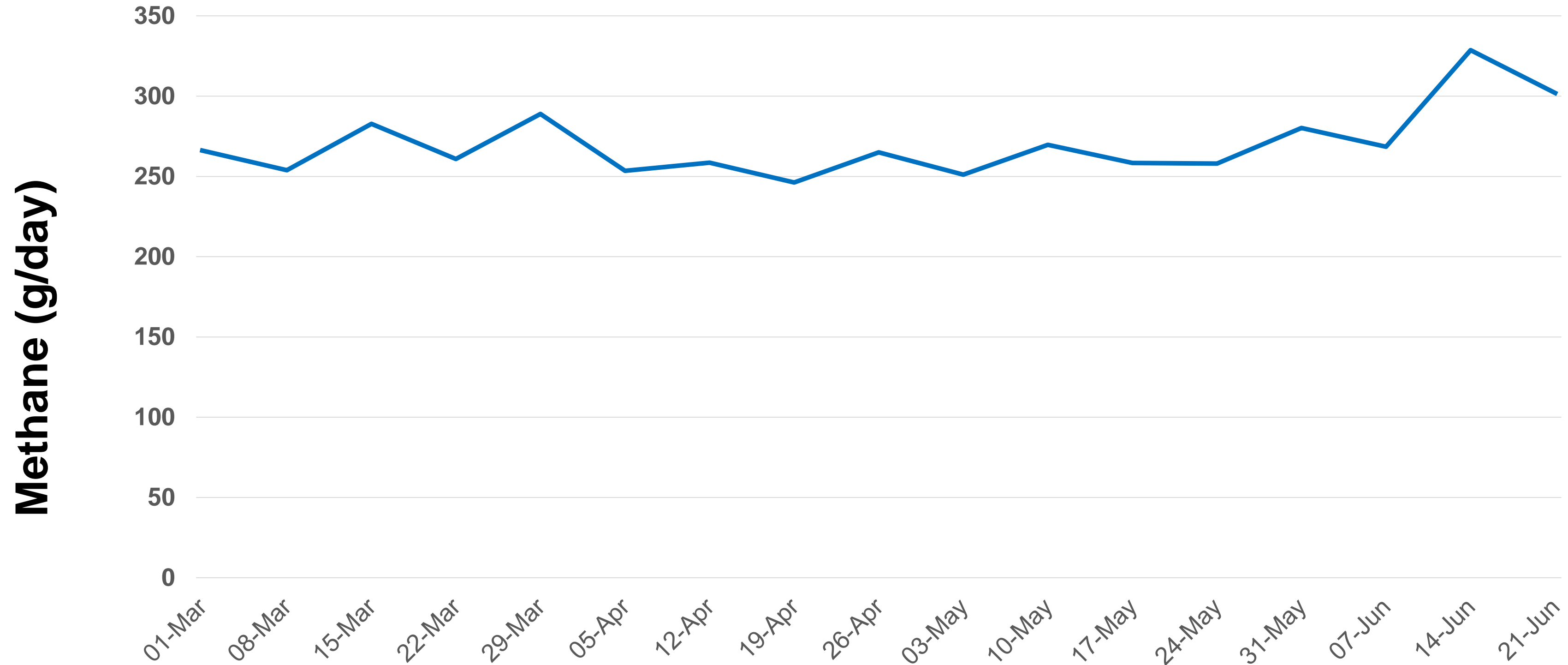


## Repeatability of methane



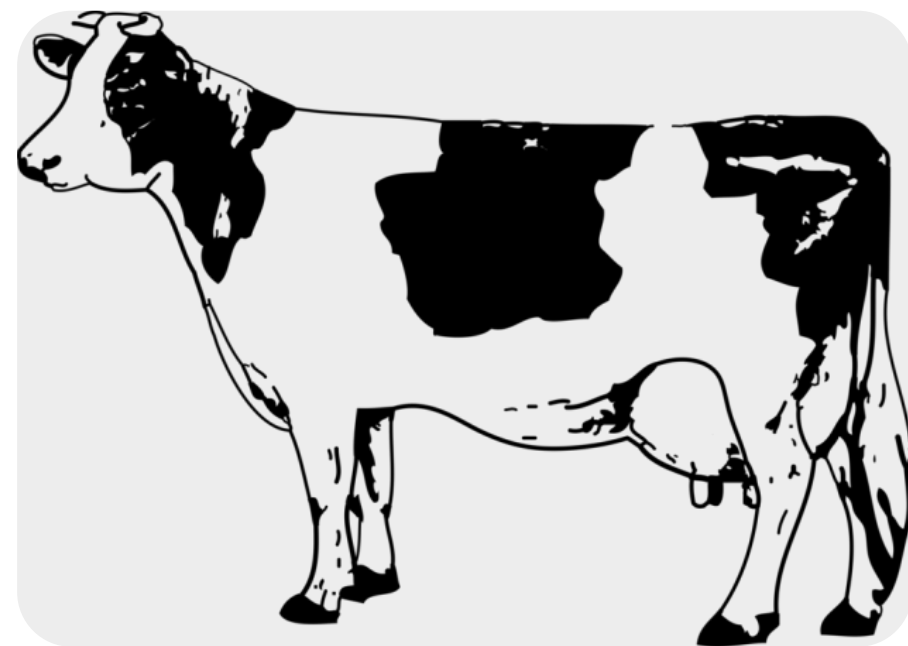
*Starsmore et al. (unpublished)*

# Methane profile farm one



# Methane calculation versus measurement

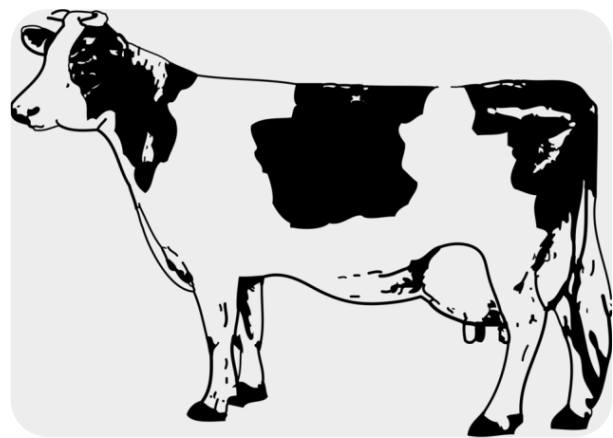
Current emission factor used to calculate methane in the national inventory is an emission factor derived across a number of study populations and countries  
(IPCC, 2019)



Gross energy intake  $\times$  **0.065**

# Methane calculation versus measurement

	Calculation	Measurement	Difference
March	338 g	271 g	+ 67
April	361 g	256 g	+105
May	357 g	260 g	+97
June	323 g	295 g	+28



Gross energy intake

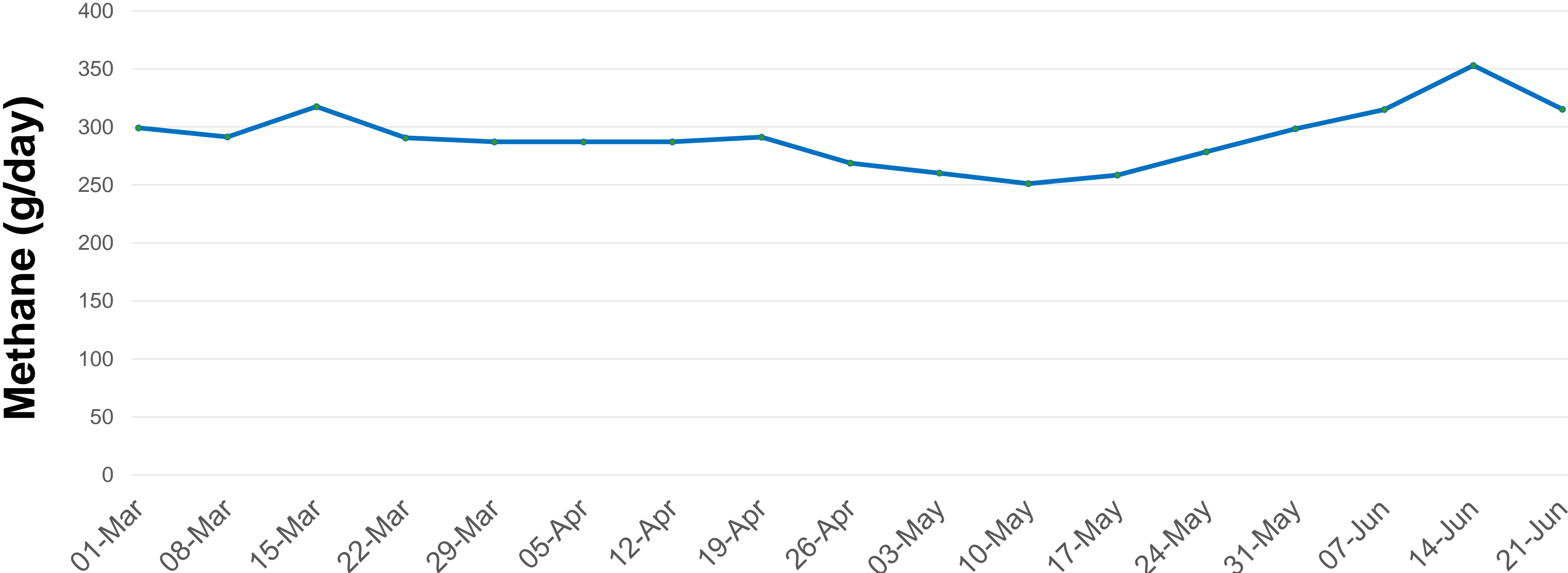
×

**0.065**



AGRICULTURE AND FOOD DEVELOPMENT AUTHORITY

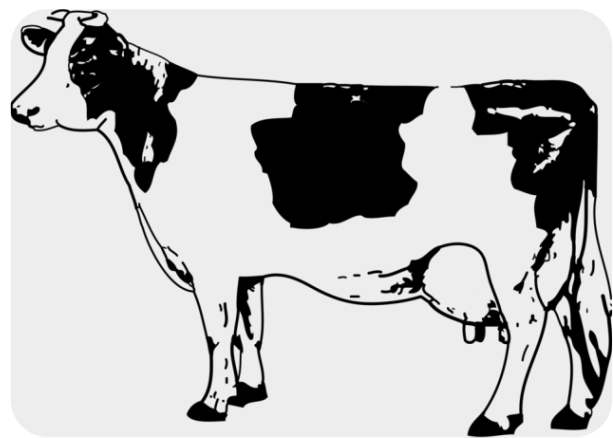
# Methane profile farm two





# Methane calculation versus measurement

	Calculation	Measurement	Difference
March	380 g	295 g	+85
April	338 g	288 g	+50
May	347 g	259 g	+88
June	330 g	324 g	+6



Gross energy intake

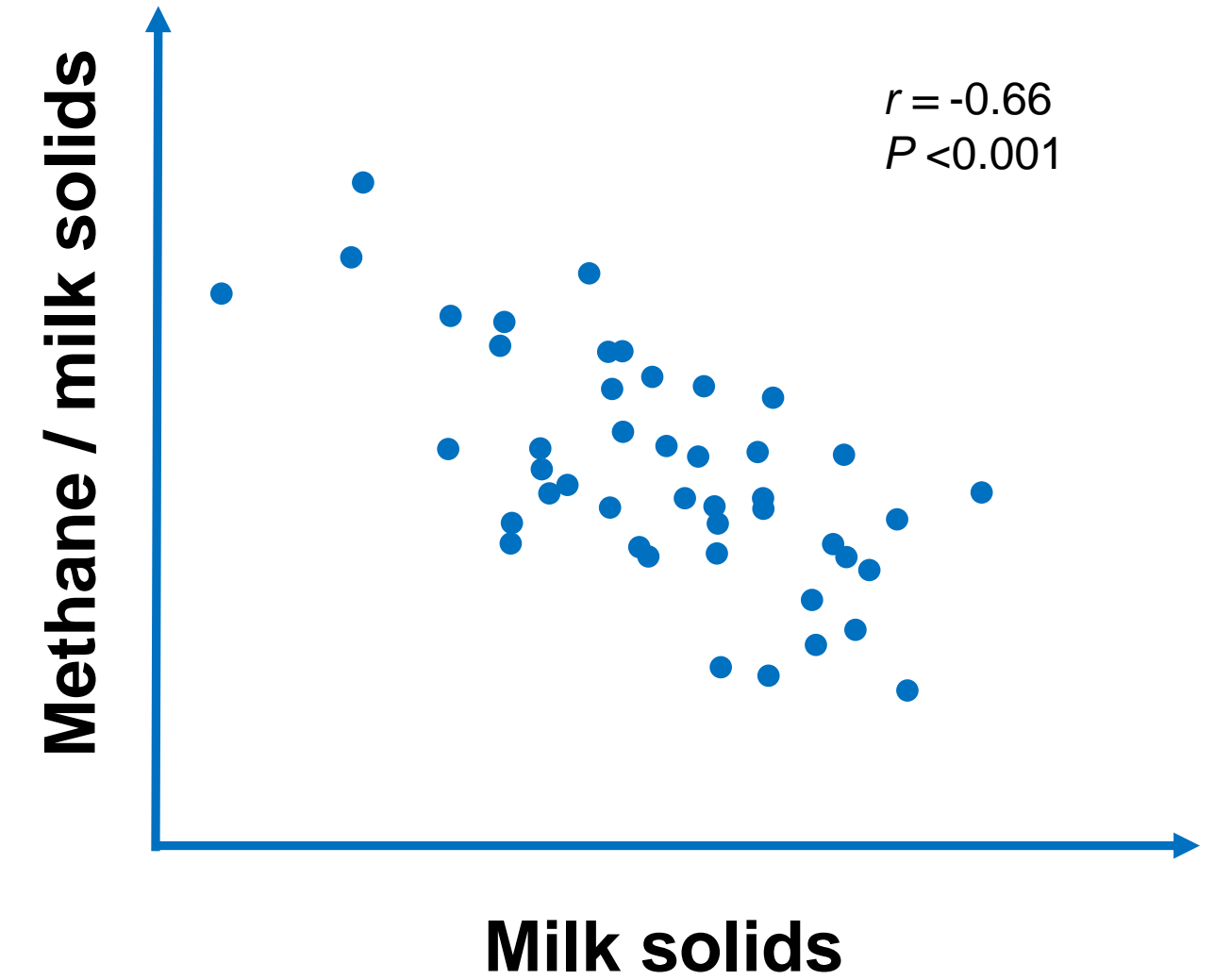
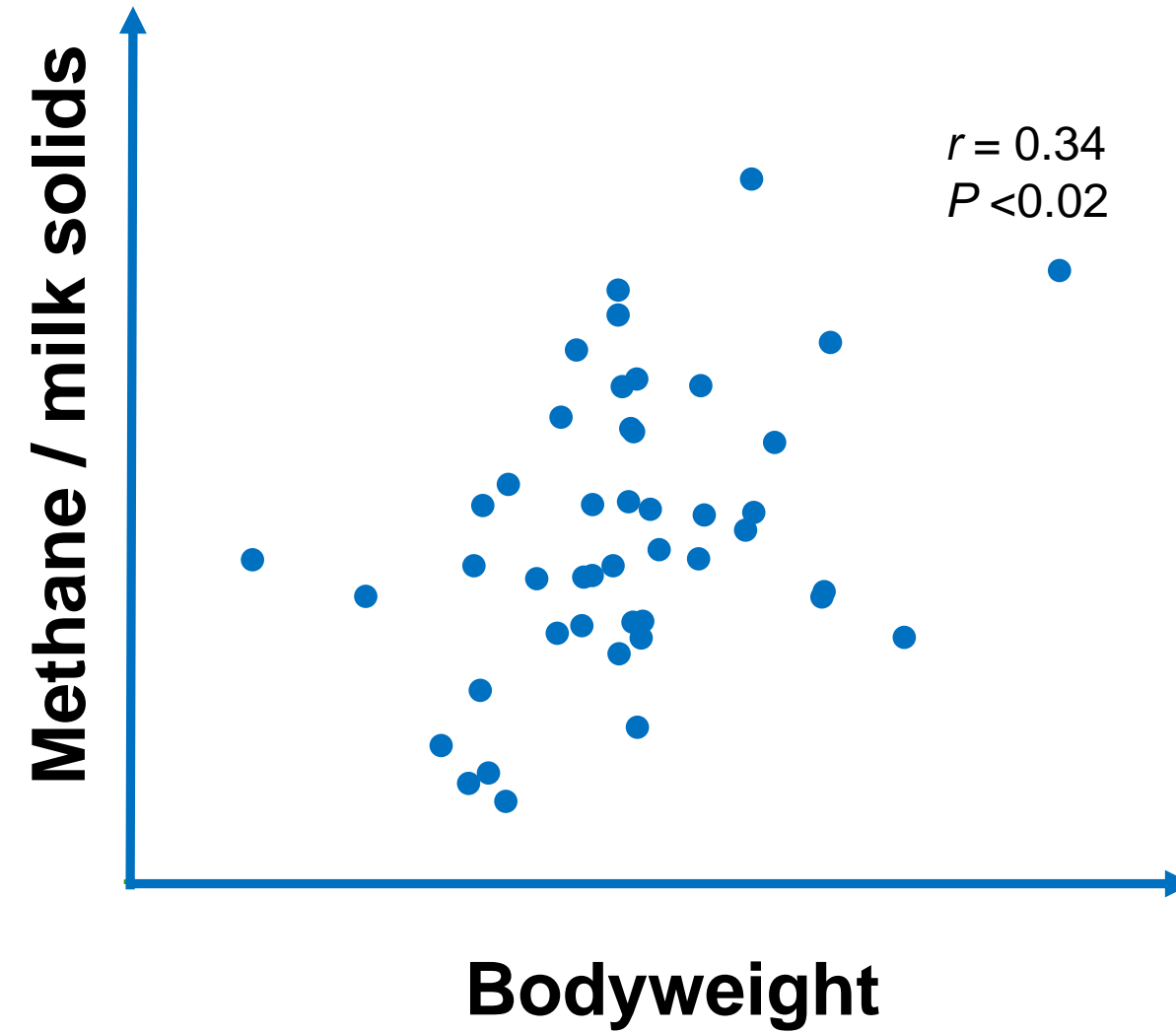
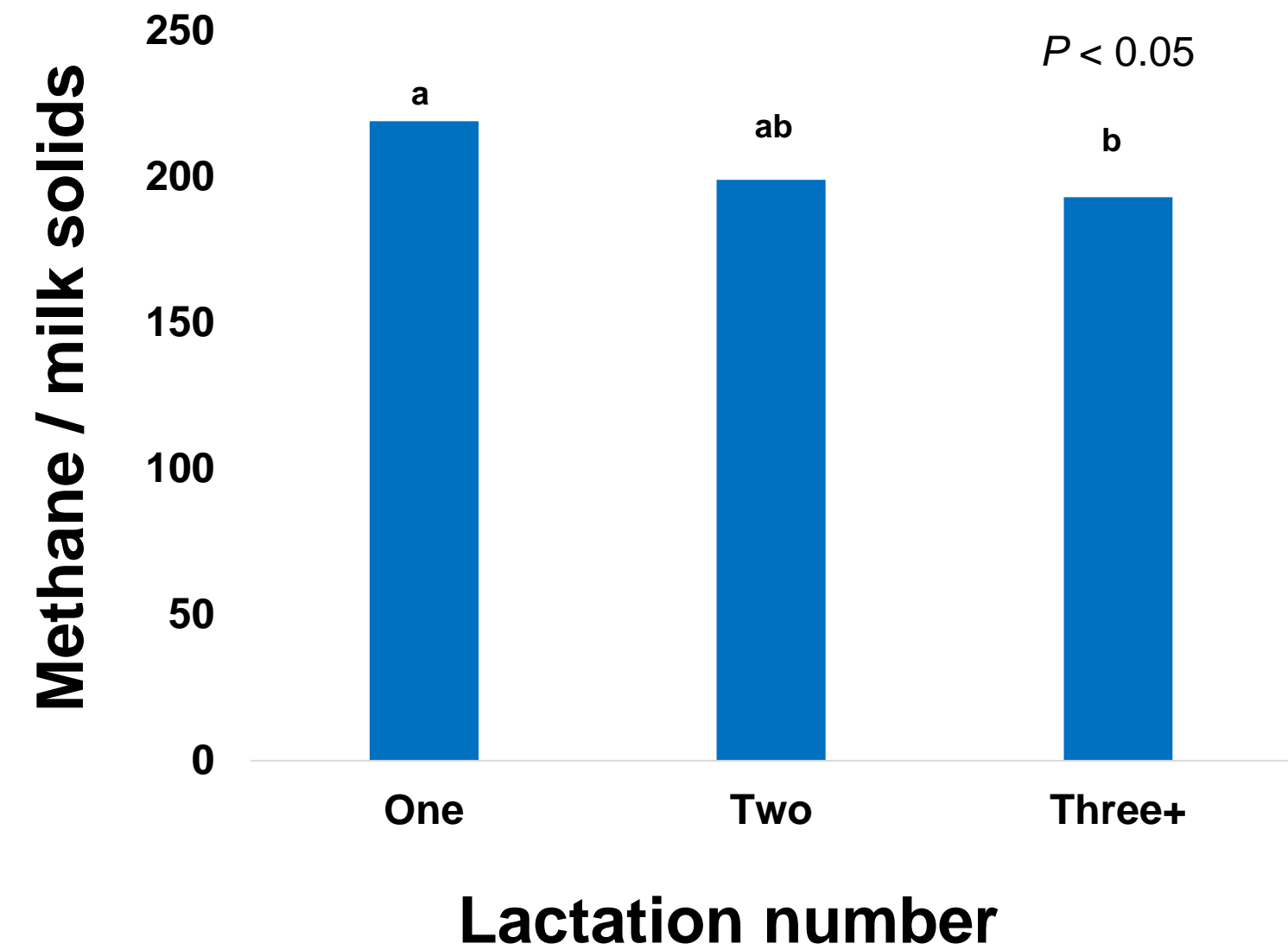
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**0.065**

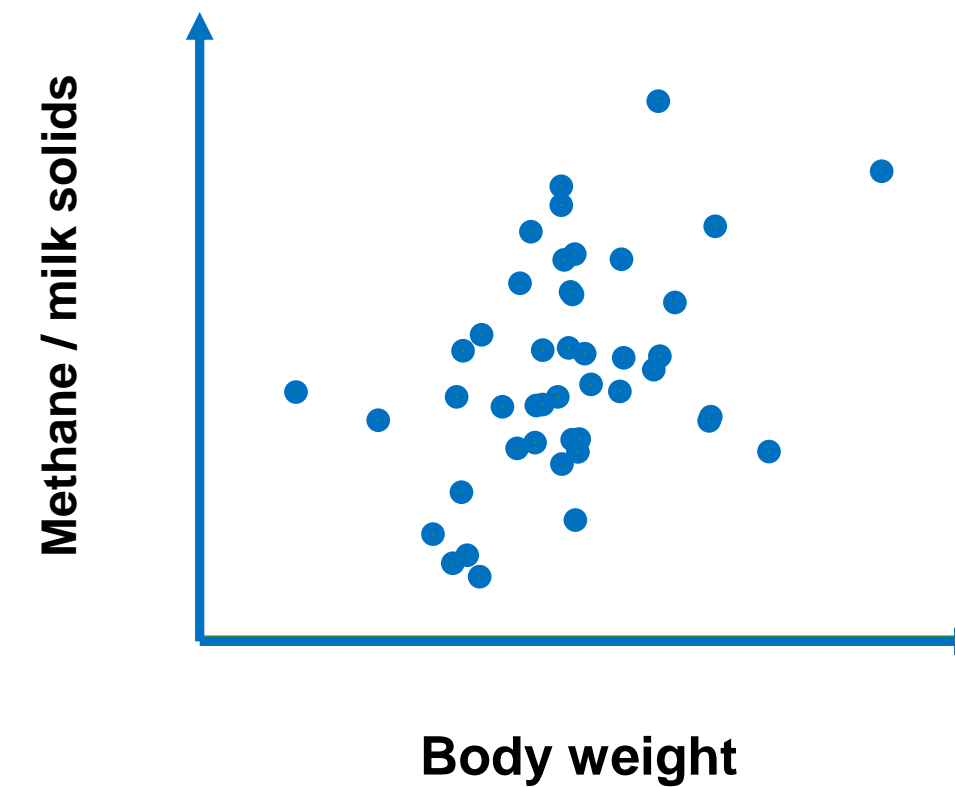
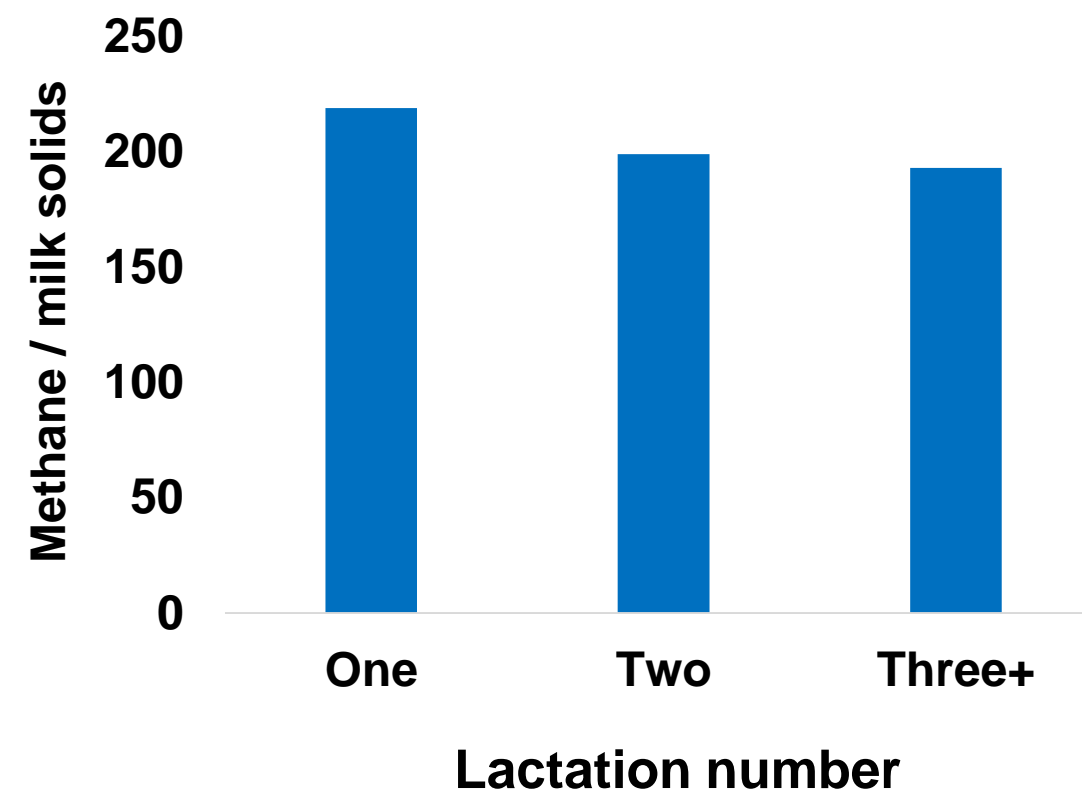
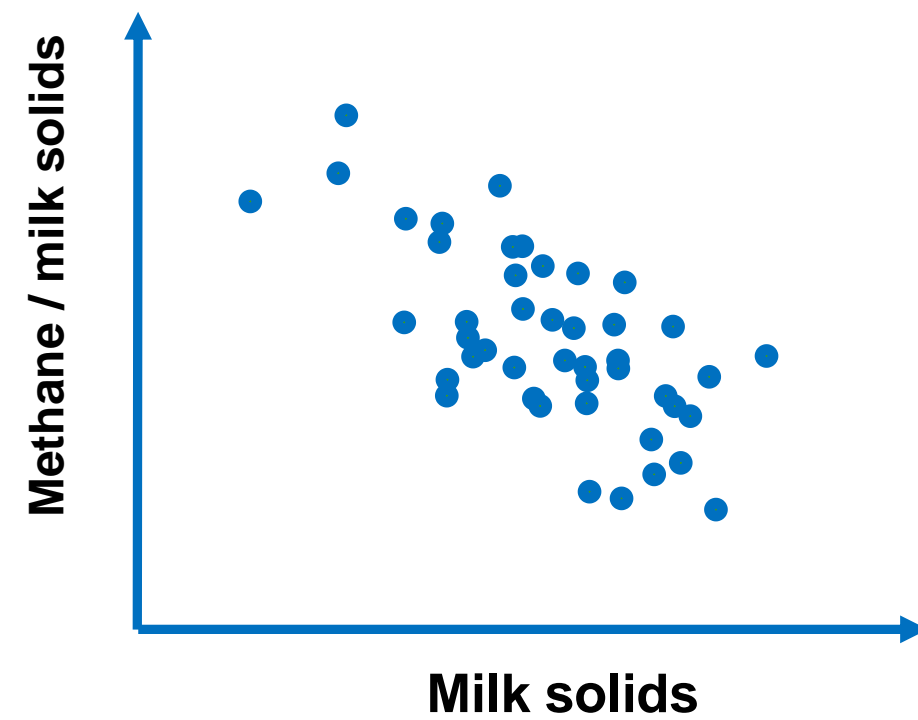
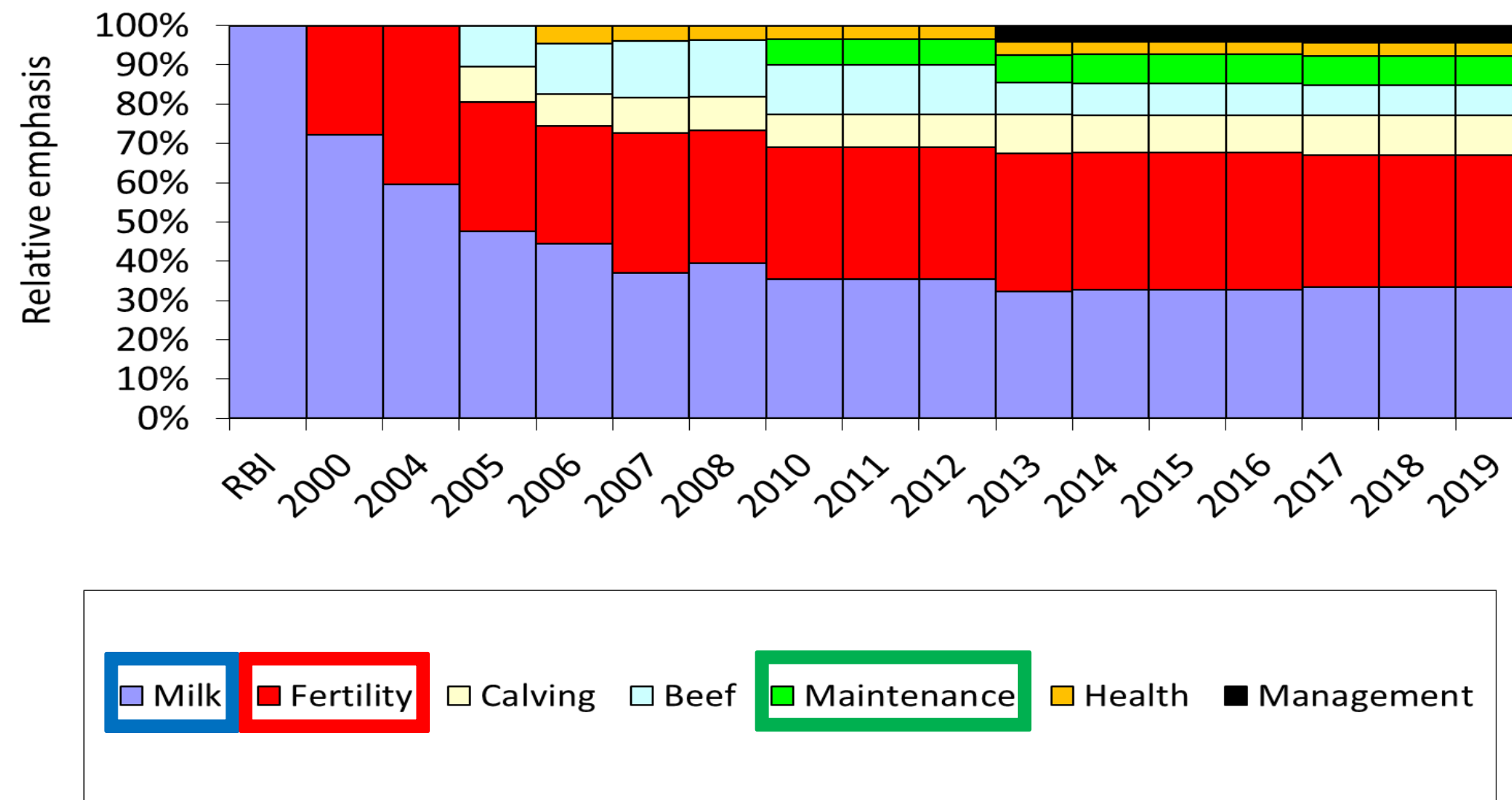


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# Animal traits influencing methane



# Economic Breeding Index



# Environmental footprint of the Next Generation Herd

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**Elite (€181)**   **NatAv (€80)**

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CO<sub>2</sub>-eq, tonnes / ha                      **16.2**                      **16.3**

# Environmental footprint of the Next Generation Herd

**Elite (€181)**   **NatAv (€80)**

CO<sub>2</sub>-eq, tonnes / ha

**16.2**

**16.3**

FPCM, kg

**16879**

**15326**

# Environmental footprint of the Next Generation Herd

**Elite (€181)**   **NatAv (€80)**

CO<sub>2</sub>-eq, tonnes / ha

**16.2**

**16.3**

FPCM, kg

**16879**

**15326**

CO<sub>2</sub>-eq, kg / kg FPCM

**0.96**

**1.06**

**€10 increase in EBI = 1% less  
CO<sub>2</sub>-eq kg / kg FPCM**

# Feed additives

PENN STATE NEWS

HOME RESEARCH ACADEMICS IMPACT CAMPUS LIFE ATHLETICS ADMINISTRATION ARTS AND ENTERTAINMENT

## Seaweed feed additive cuts livestock methane but poses questions

- Up to 80% reduction and no effect on milk yield when fed up to 0.5% of DMI
- Questions raised:
  - Is it effective long term? Adaptation?
  - Stability of active ingredients?
  - Palatability?

## DSM: Dutch dairy cattle trial shows efficacy of methane reducing feed additive

By Jane Byrne

04-Feb-2021 - Last updated on 05-Feb-2021 at 09:26 GMT

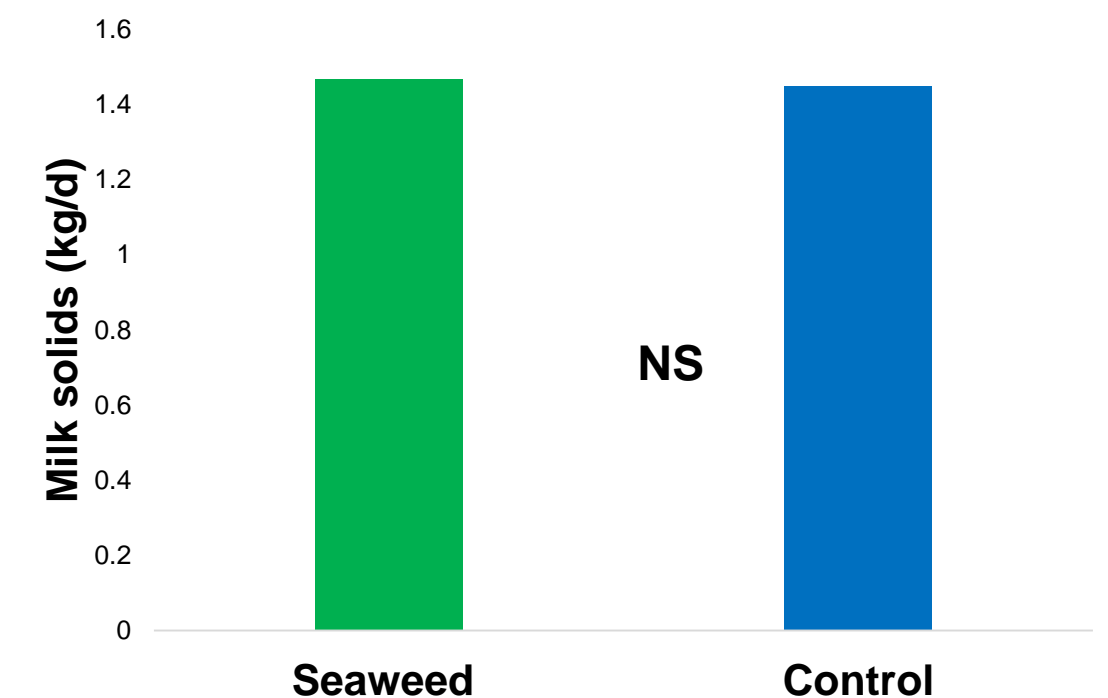
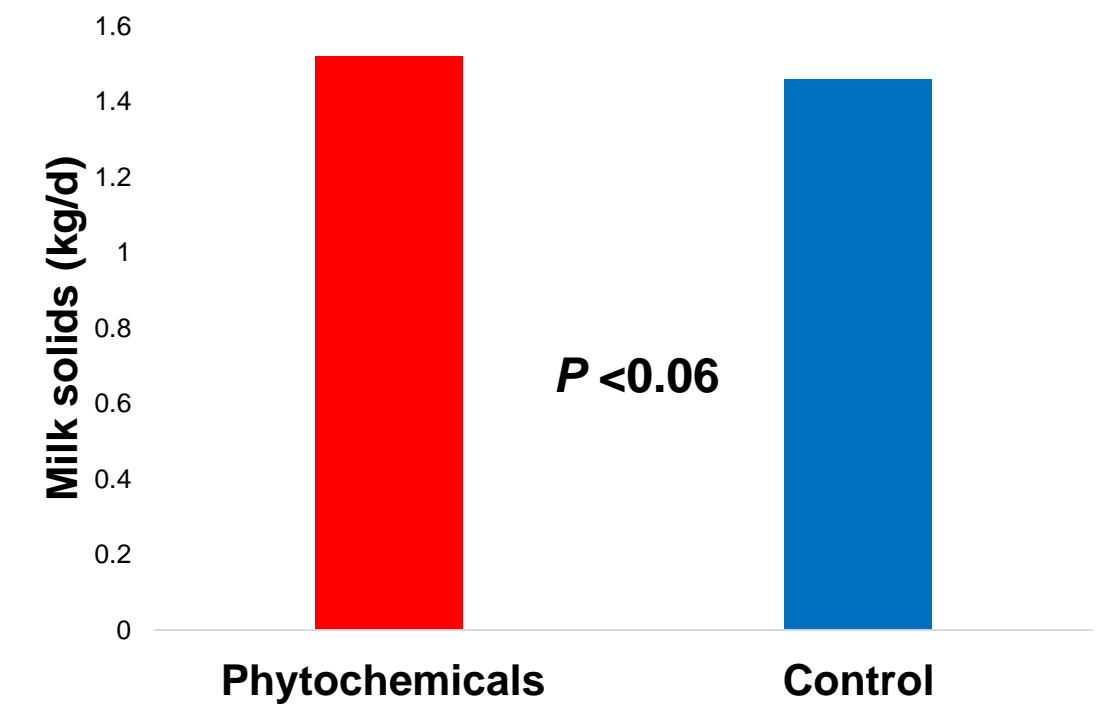
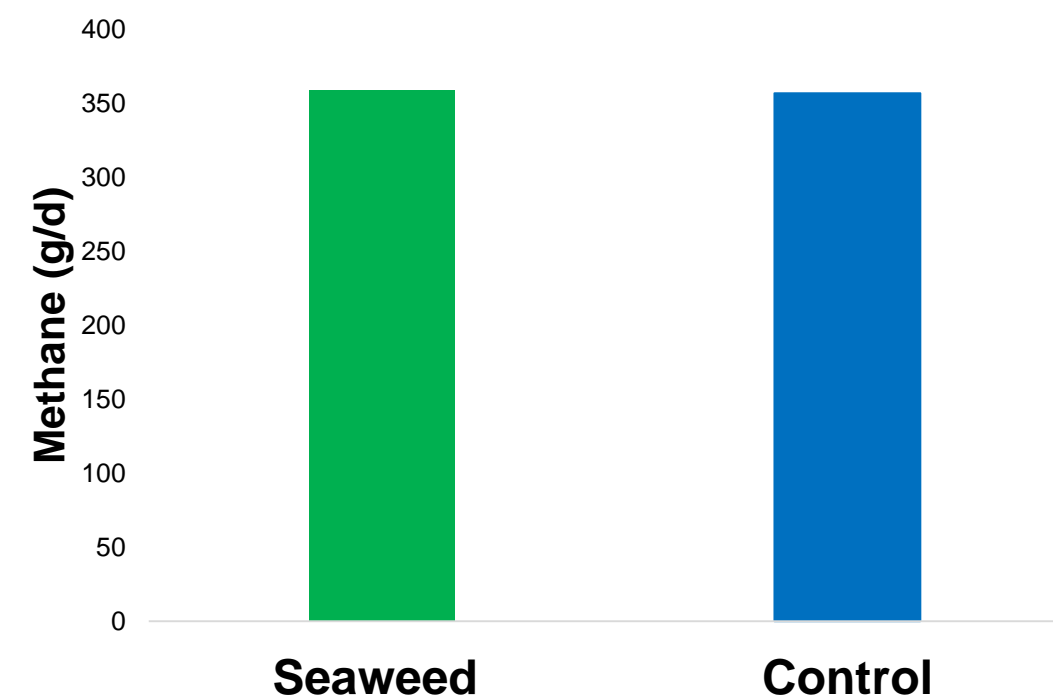
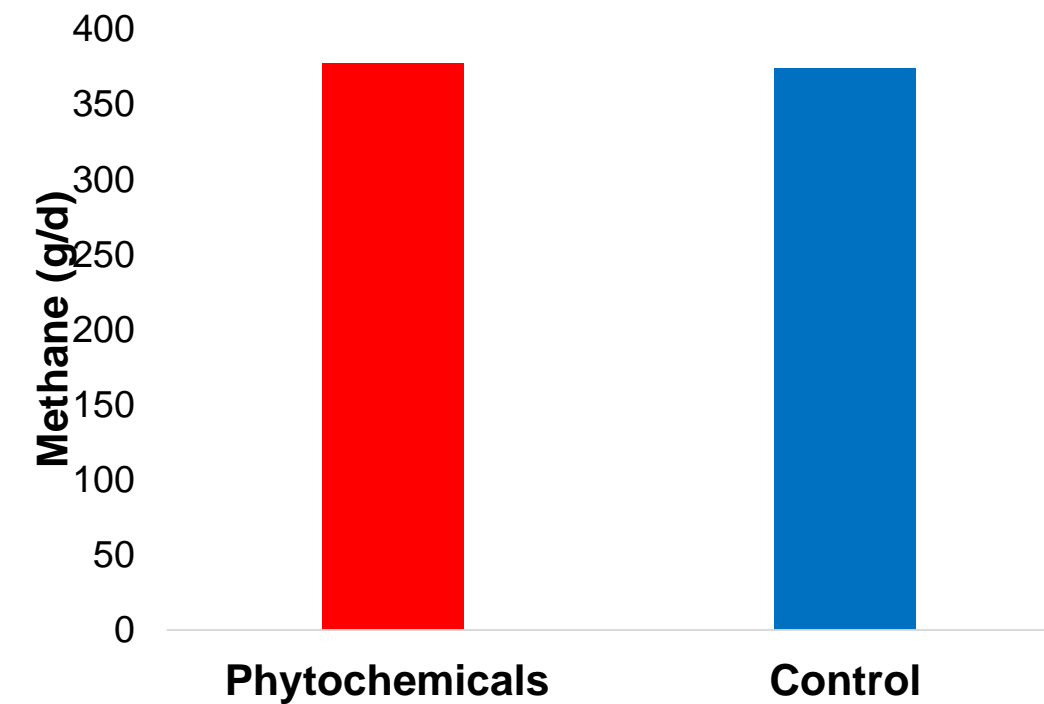


© GettyImages/Clara Bastian

RELATED TAGS: methane emissions

# Additive experiments at pasture

- Two studies were conducted in 2020 evaluating: 1) phytochemicals and 2) a blend of seaweeds on methane emissions and milk production in grazing dairy cows.
- Animals within each study randomly assigned to a treatment and control group. Methane emissions and milk production recorded daily.





# Conclusion

- **Swards characteristics and methane need more research**
- **EBI breeding more efficient animals**
- **Virtually all additive research globally is in indoor systems**
  - **Focus on additives suitable for grazing systems needed**

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