Methane emissions in grazing dairy systems

Ben Lahart, Katie Starsmore, Jonathan Herron and Laurence Shalloo

Teagasc Research insights
14th July, 2021

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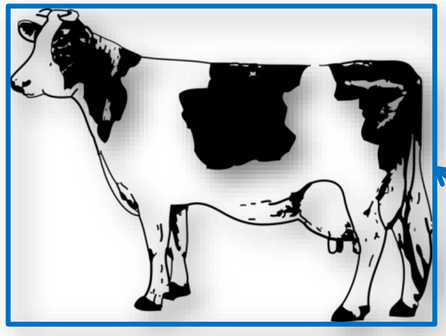
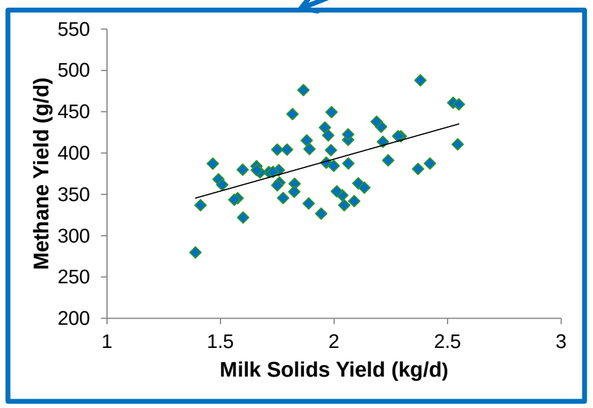


Animal factors

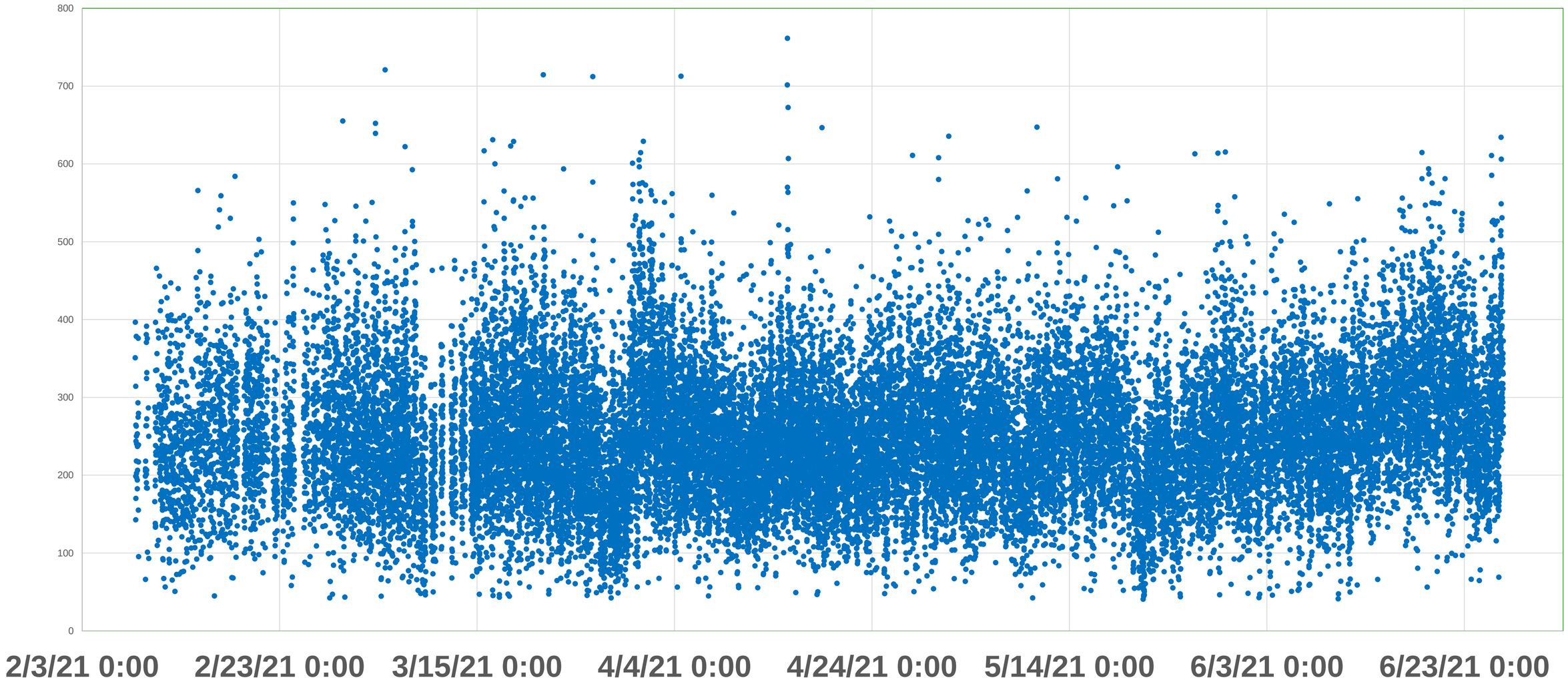
Sward factors



Prediction models

Feed additives

Measurement profile 2021



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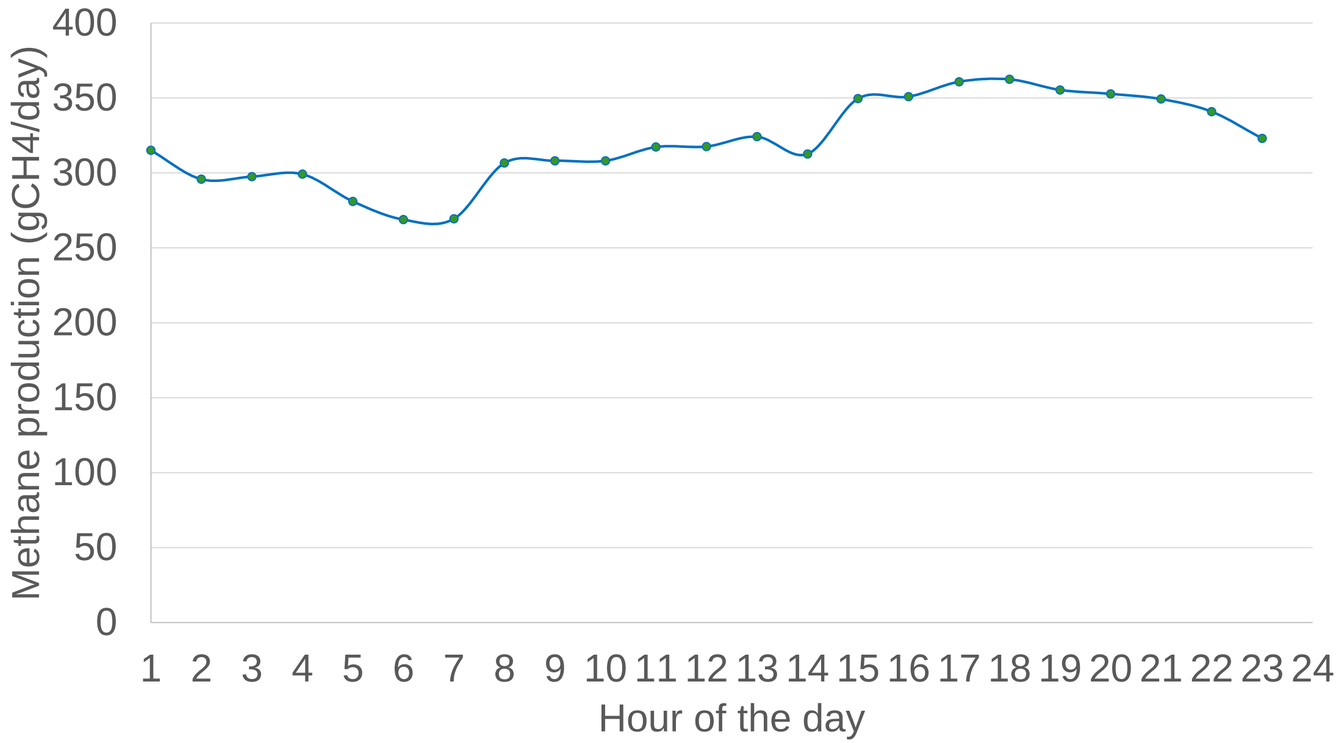
Diurnal pattern of methane production



Repeatability of methane

Starsmore et al. (unpublished)

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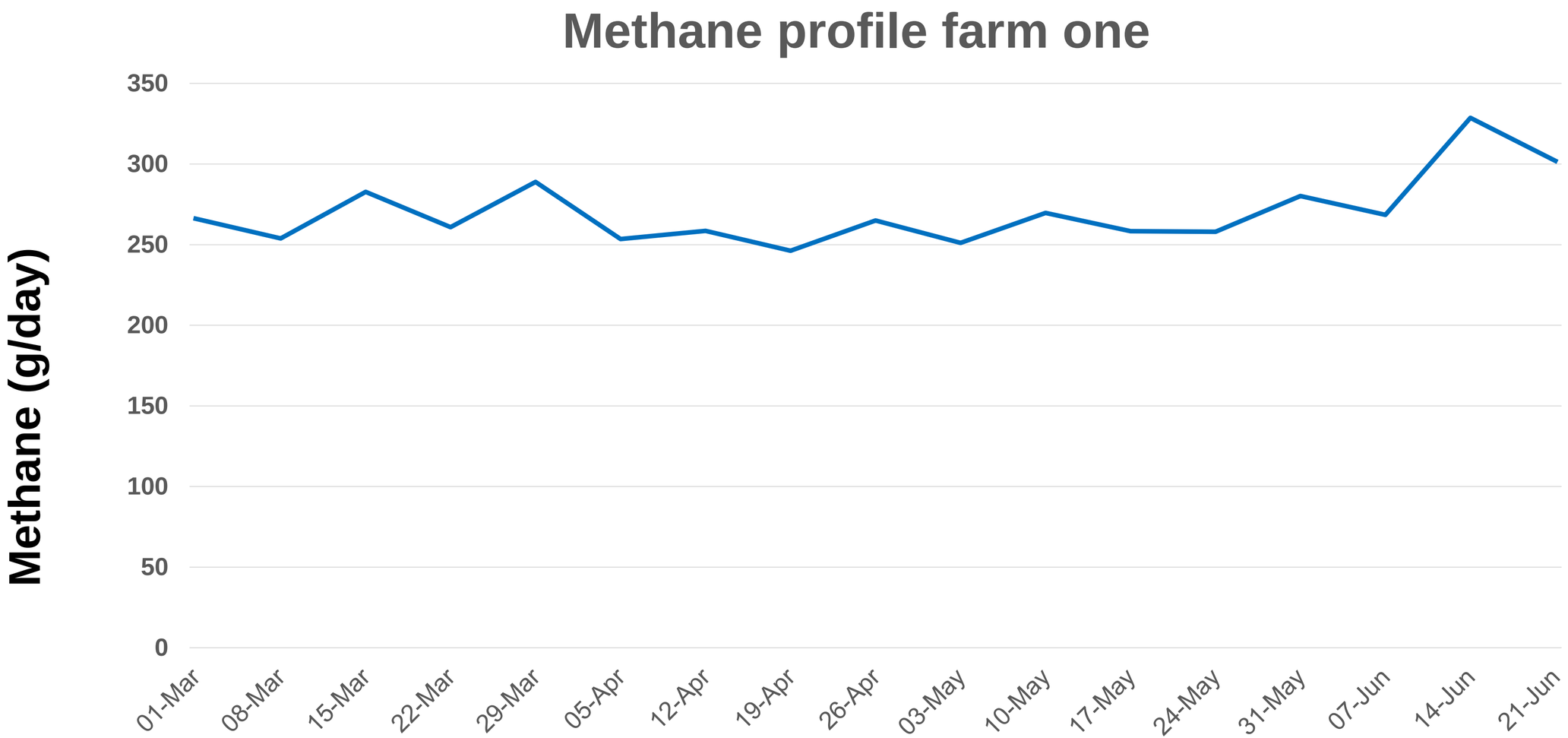
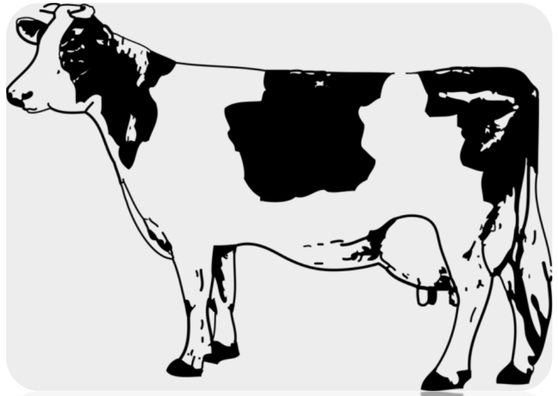


Methane calculation versus measurement

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 × **0.065**

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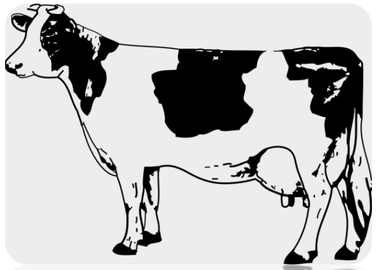
Methane calculation versus measurement

	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



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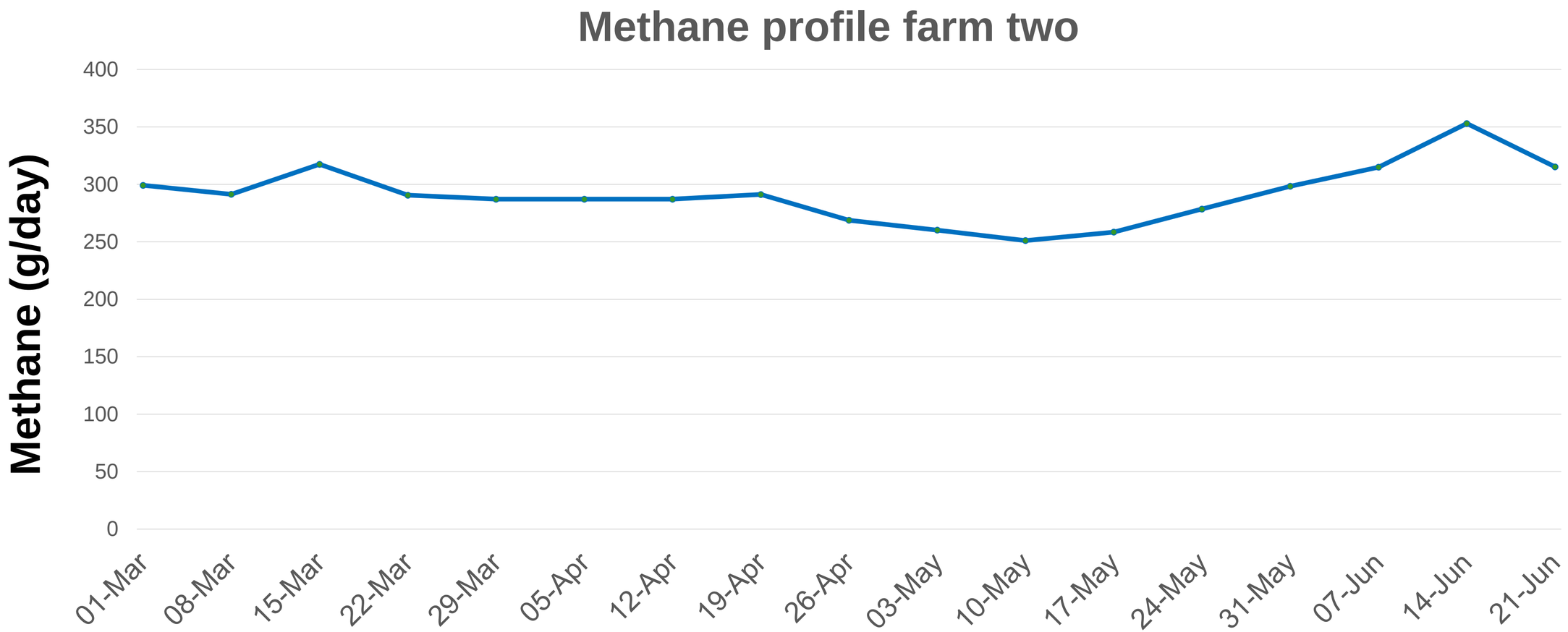

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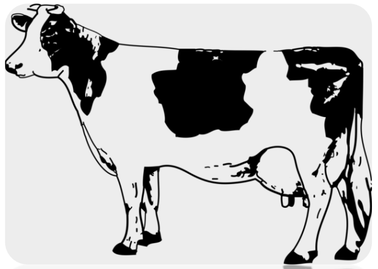
Methane calculation versus measurement

	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 × **0.065**

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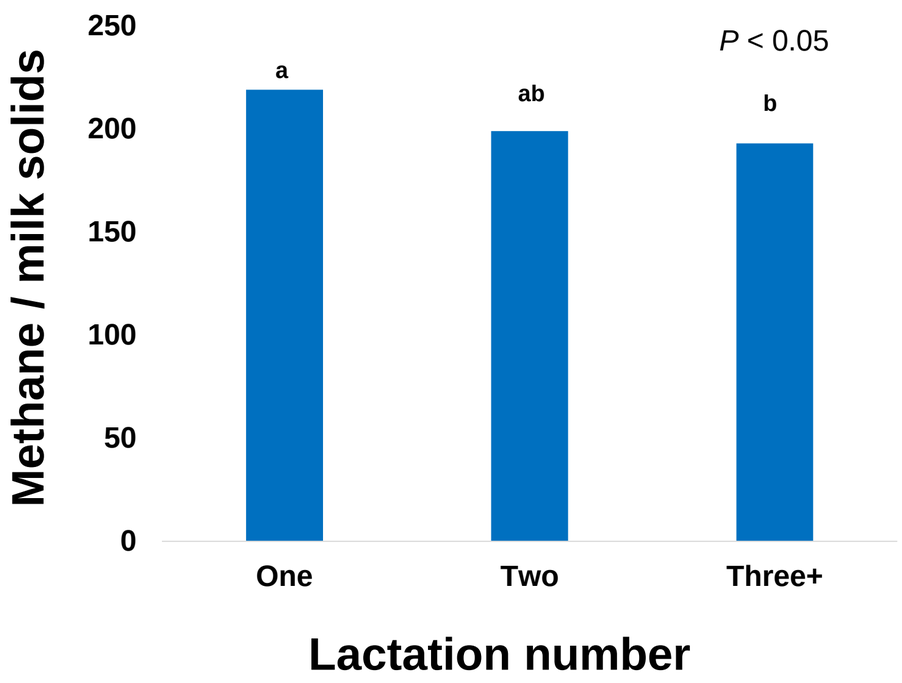
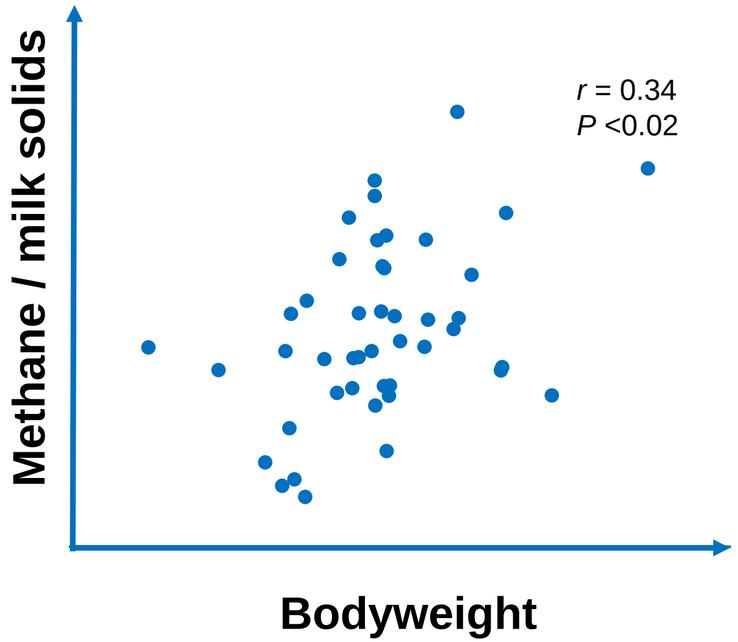
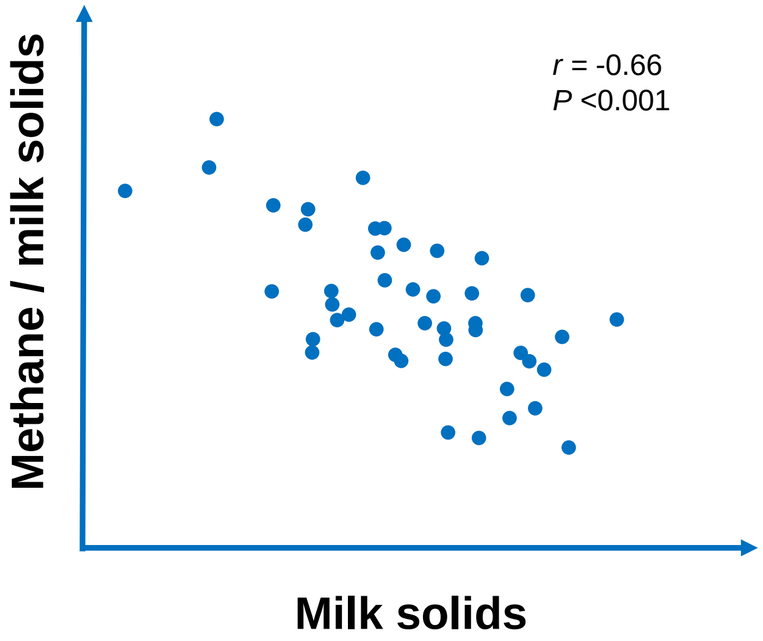
Animal traits influencing methane







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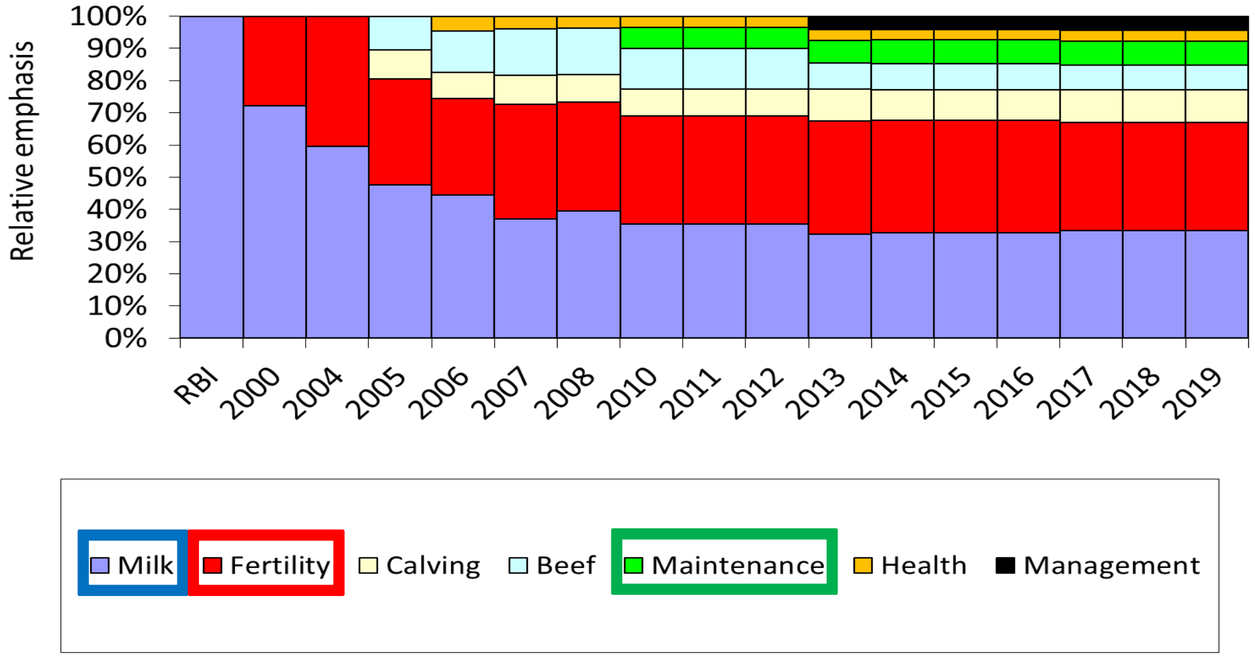
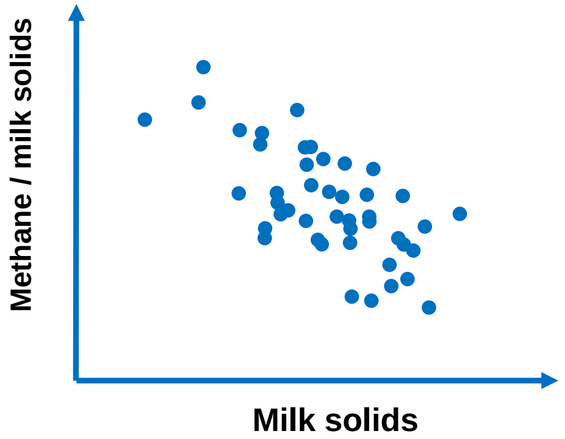
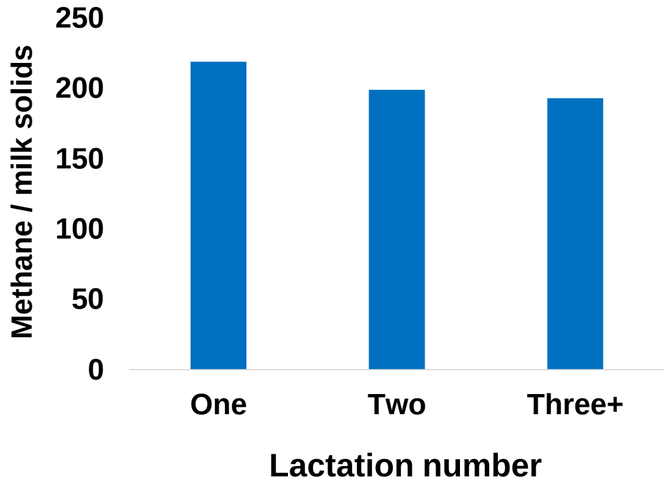
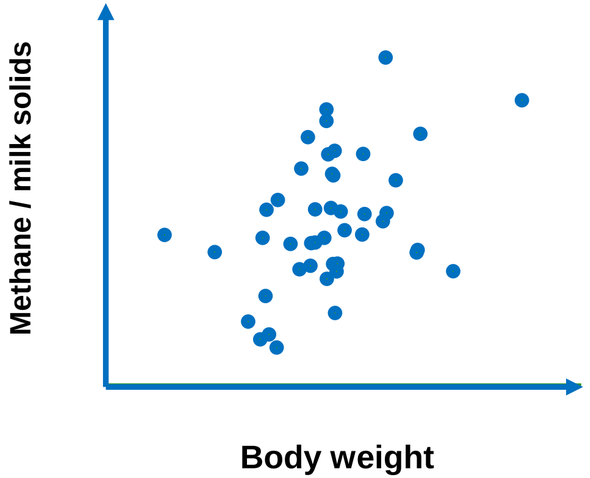
Economic Breeding Index









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Environmental footprint of the Next Generation Herd

	Elite (€181)	NatAv (€80)
CO_2-eq, tonnes / ha	**16.2**	**16.3**

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FPCM, kg	**16879**	**15326**

Environmental footprint of the Next Generation Herd

	Elite (€181)	NatAv (€80)
CO_2-eq, tonnes / ha	**16.2**	**16.3**
FPCM, kg	**16879**	**15326**
CO_2-eq, kg / kg FPCM	**0.96**	**1.06**

€10 increase in EBI = 1% less CO_2-eq kg / kg FPCM

Feed additives

PENN STATE NEWS

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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

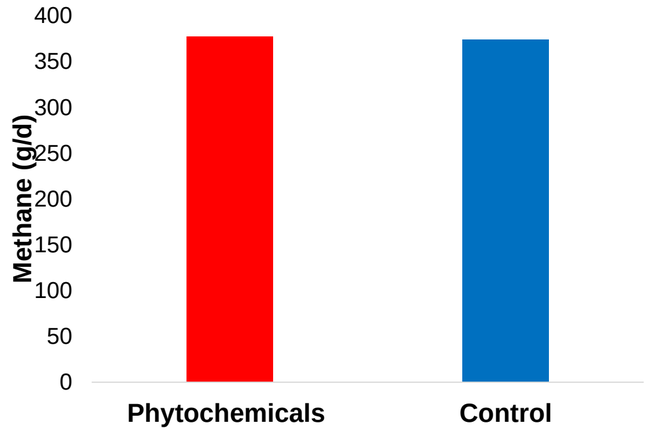
04-Feb-2021 - Last updated on 05-Feb-2021 at 09:26 GMT

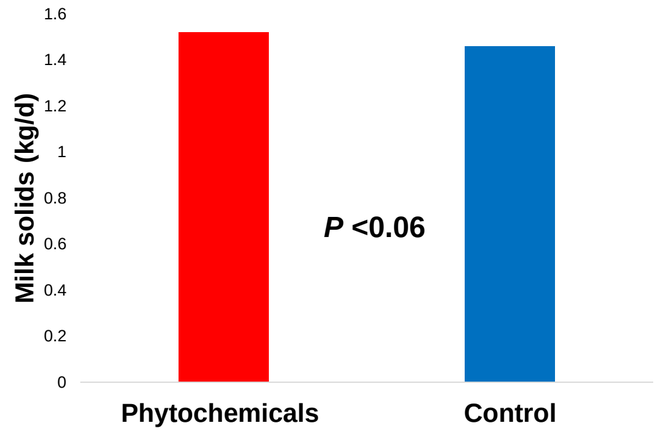
RELATED TAGS: methane emissions

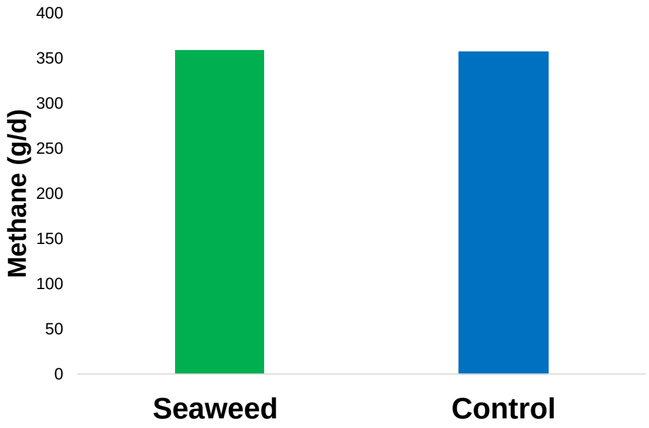
Additive experiments at pasture

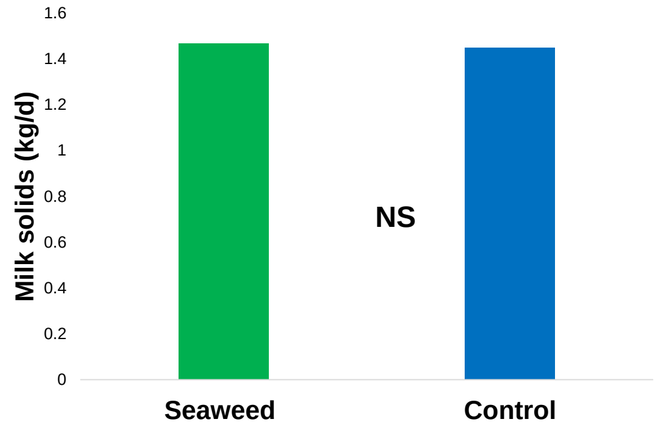
- Two studies were conducted in 2020 evaluating: 1) phytochemicals and 2) a blend of seaweeds on methane emissions and milk production in grazing dairy cows.

- Animals within each study randomly assigned to a treatment and control group. Methane emissions and milk production recorded daily.









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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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VistaMilk

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