Methane emission from grazing dairy cows

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SEGES Innovation
KvægKongres, 25. februar, 2025

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Questions ?

- How much can grazing reduce enteric methane emission under Danish conditions ?
- Is it necessary with day and nigth grazing to achieve a reduction ?
- Is the methane reduction dependent on grass uptake ?
- Is the methane reduction dependent on season ?

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Herds & design

- 5 organic herds: Jersey, Red & Holstein
- 4 AMS herds & 1 twice daily milking
- 4 herds daily grazing & 1 herd day and night
- Methane measured with GreenFeed units
- Whole herd had access to the GreenFeeds
- Rotational grazing – one new paddock per day
- PMR fed during the grazing season – amount depending on fresh grass intake

- Control: organic rations fed inside in March and April
- Treatment: grazing from April/May until October

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Average control ration fed in march/april

Feed stuff	Kg DM
Clover-grass silage	12.5
Grain	3.6
Faba beans, lupins & rape seed	1.6
Compound feed	3.4
Other	3.6
Total	24.6

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Example of feed control used for estimating grass uptake
– 8.7 kg DM fresh grass/cow/day in this case

Antal dyr			Malkende	
			68	
Fodermiddel	Øre/kg	Enhed	Tildelt dyr/dag	Tildelt
Havre	**220,0**	Kg TS	1,3	
Hvede	**240,0**	Kg TS	1,0	
Rapsfrø, 00	**700,0**	Kg TS	0,4	
Ærter	**450,0**	Kg TS	0,3	
Afgræsning 30. april 2024	13,1	Kg TS	8,7	
2022 Lucerne 1. slæt	22,0	Kg TS	0,6	
2022 Helsæd + 3. slæt i bund	36,8	Kg TS	4,4	
2023 Enghø	57,0	Kg TS	0,4	
2023 1. slæt	56,3	Kg TS	2,3	
2023 4. slæt	22,1	Kg TS	1,4	
Naturko Slik 21 Majs	**418,5**	Kg TS	2,6	
Total		Kg TS	23,3	

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Estimated grass uptake

- Average uptake: 1002 kg DM/cow/year
- Minimum: 571 kg DM/cow/year
- Maximum: 1613 kg DM/cow/year

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GreenFeed installation

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GreenFeed outside

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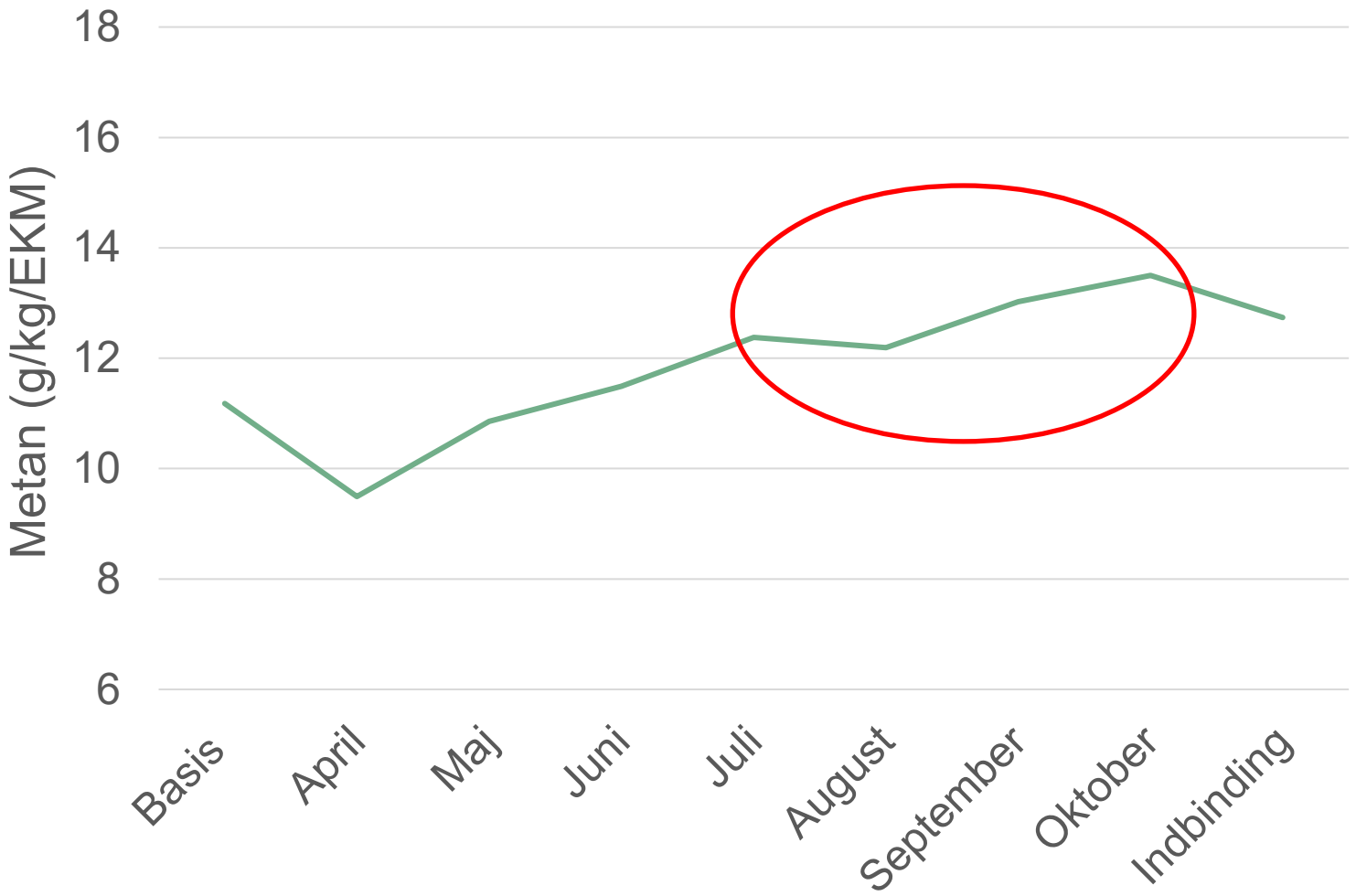
Methane intensity (n=2)



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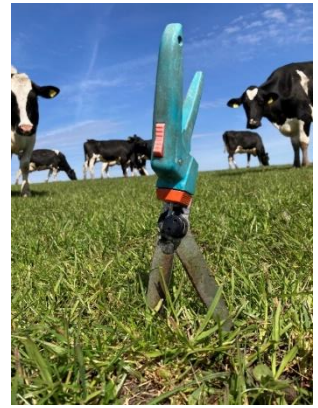
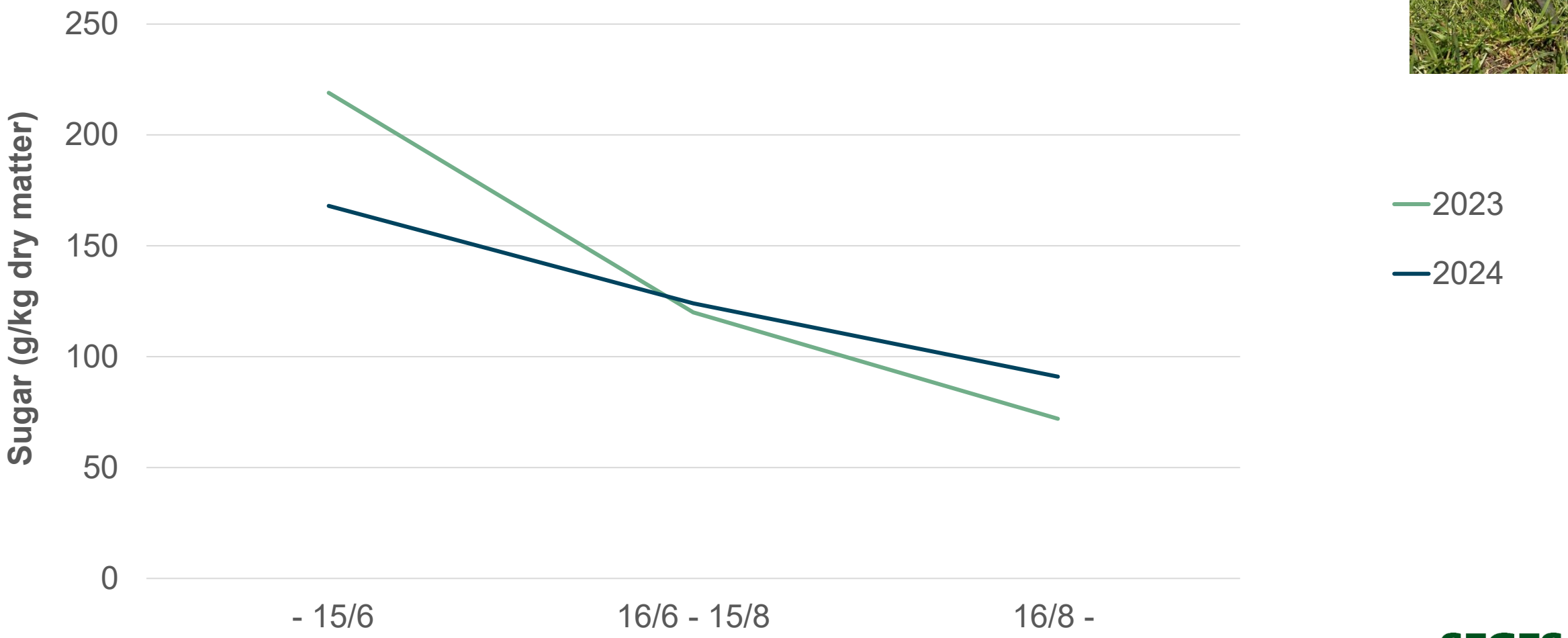
Sugar





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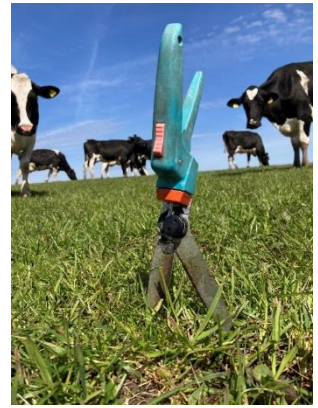
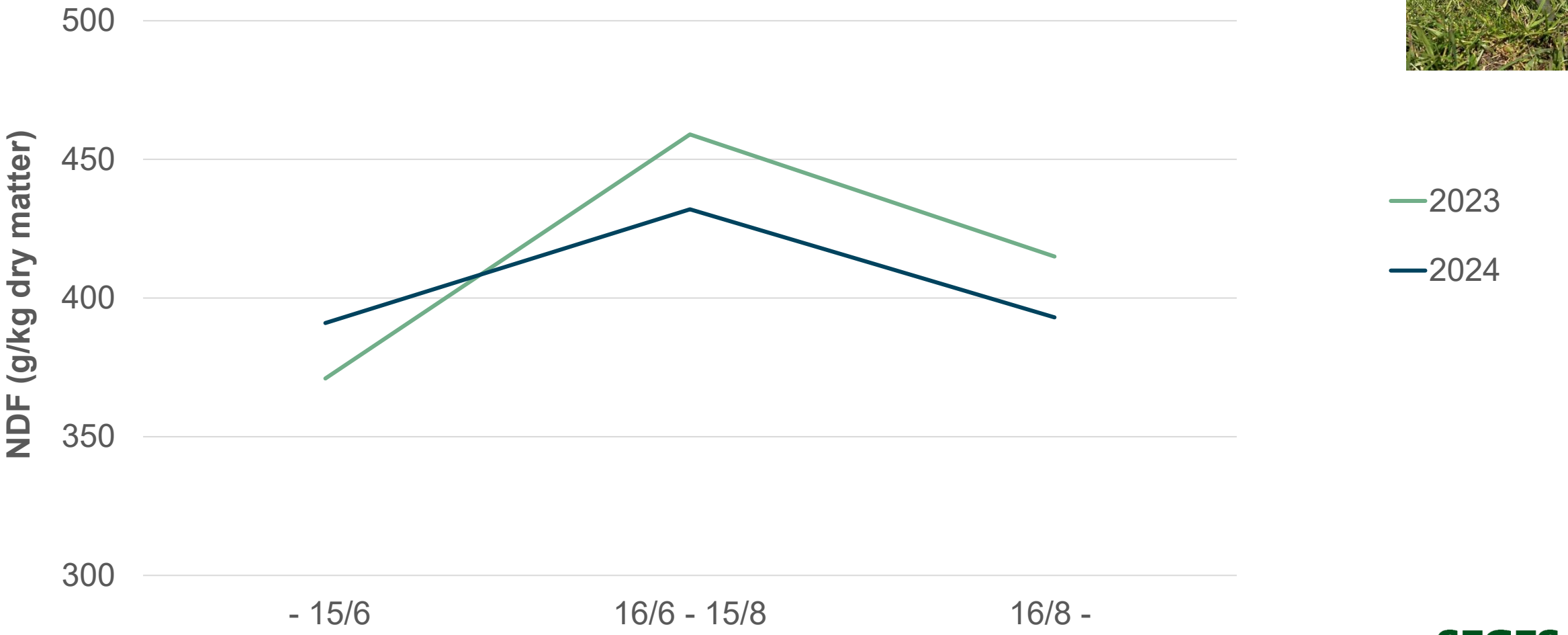
NDF





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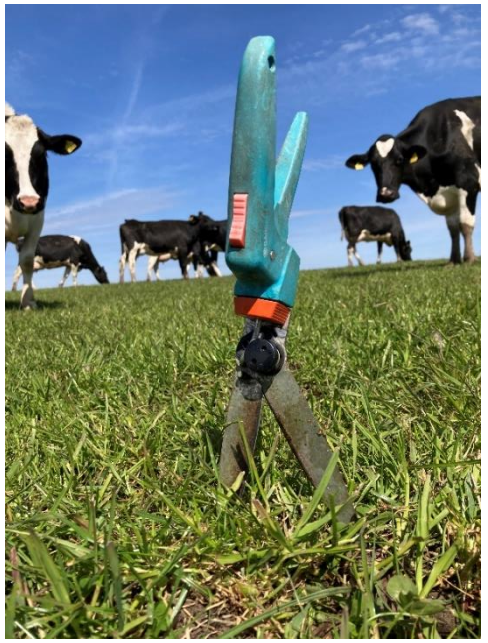
Explanations for reduced methane



- High sugar
- Low NDF
- Quickly fermented NDF
- => Lower pH in the rumen

- Fatty acids ?

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Carbon footprint of milk assuming 2% yearly methane reduction

	Control	Grazing
Carbon footprint (kg CO2e/kg ECM)	1.10	1.09

→ 1% reduction of the carbon footprint of milk

- Reduced emissions from grazed grass ☺
- Reduced emissions from barn and storage ☺
- Increased use of area ☹
- Increased feed consumption and increased methane in Nov & Dec ☹

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Many thanks to Farmers and their cows

Thanks to colleagues:
Anne Mette Kjeldsen
Malene Vesterager Byskov
Rudolf Thøgersen
Søren Kørup Christensen
Villy Nicolajsen

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Thank you for your attention
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