Does replacing grass silage by maize silage in Flemish dairy cattle diets lead to methane reduction?

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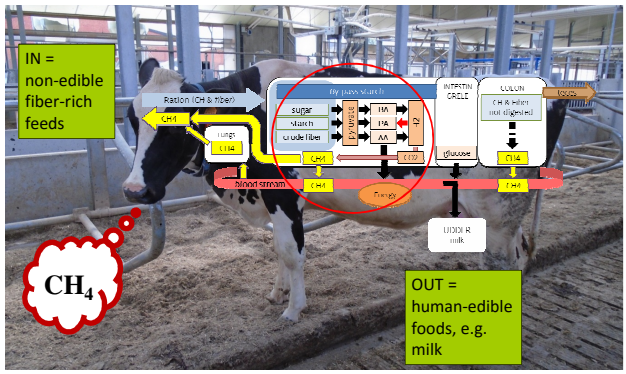
Introduction



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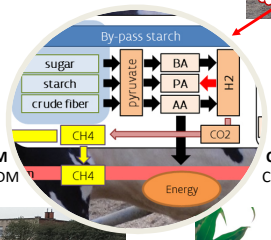
Introduction

Grass silage

Starch: 0 g/kg DM
Crude Fiber: 270 g/kg DM
Crude Protein: 150 g/kg DM



Maize silage

Starch: 430 g/kg DM
Crude Fiber: 155 g/kg DM
Crude Protein: 80 g/kg DM

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Materials and Methods

Diet 1 (GS)	Diet 2 (MS)
24% maize silage	44% maize silage
45% grass silage	24% grass silage
31% concentrates	32% concentrates

Animals
12 Holstein Friesian cows (6 CTRL + 6 TRTD)
103 ± 30 DIM (days in milk)
31,0 ± 3,1 kg milk/day

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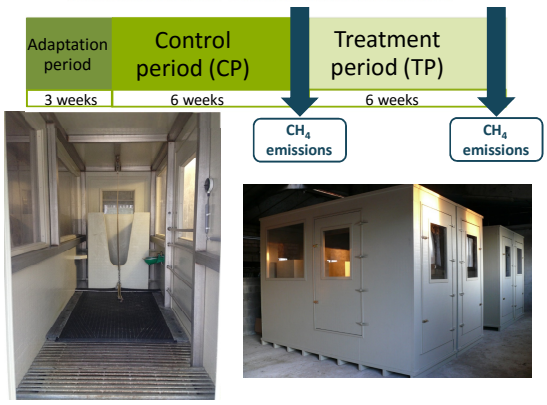
Materials and Methods



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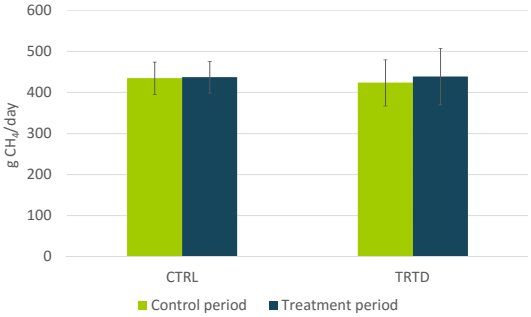
Results – g CH_4/day



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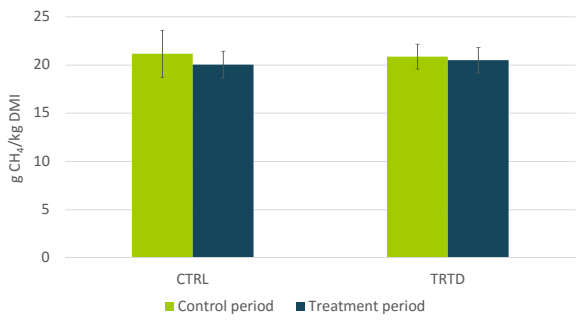
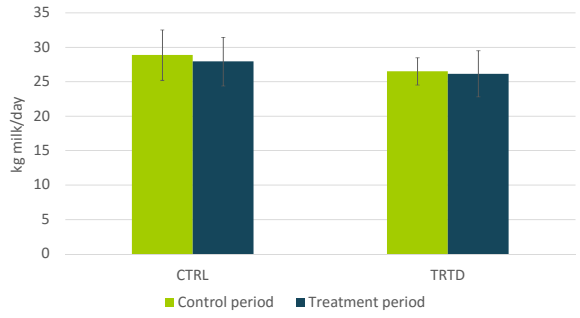
Results – g CH_4/kg DMI



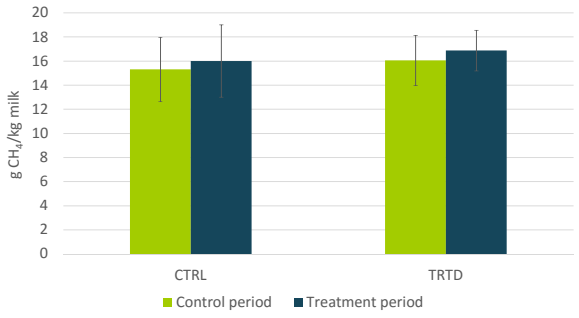
Results – nutrient intake

	CTRL		TRTD		Evolution
	CP	TP	CP	TP	TRTD cows
DMI (kg/dag)	20,6	21,8	20,3	21,4	
Crude protein (g/kg)	164	163	164	163	
Crude fat (g/kg)	29	30	29	29	
Crude fiber (g/kg)	183	185	178	165	**-13 g/kg DM**
Starch (g/kg)	189	189	196	252	**+56 g/kg DM**
Sugars (g/kg)	54	61	56	48	**-8 g/kg DM**
VEM (/kg)	970	952	978	979	
FOS (g/kg)	570	559	572	584	
DVE (g/kg)	92	88	93	89	
OEB (g/kg)	15	17	15	17	

Results – kg milk/day



Results – g CH_4/kg milk



Discussion

- In this study there was no effect on methane production caused by the replacement of grass silage by maize silage, although there was a difference in starch content.
  - Other research:
    - = No difference in CH_4 production per kg DMI or milk, with a 100g/kg DM higher starch content in the diet (Hatew et al., 2015)
    - ≠ 12% reduction in CH_4 production per kg DMI when feeding 30/70 GS/MS compared with 70/30 GS/MS (Hart et al., 2015)

Conclusion

- In practice the replacement of GS by MS in typical Flemish dairy diets is much more than only the exchange of two forages.
  - Minimum amount of starch, protein, structure needed => specific concentrates
  - Rumen is a complex and resilient ecosystem
  - When feeding balanced diets, the diet with a higher amount of MS is not better than the diet with the higher amount of GS, when considering enteric CH_4 production

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Thank you

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