Changing from a grass silage based diet to a maize silage based diet does not alter enteric methane emission in dairy cattle

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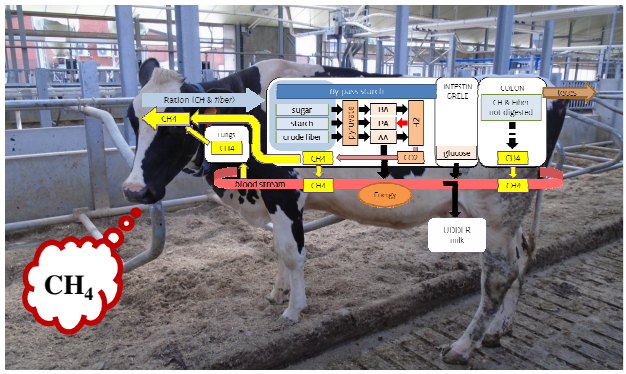
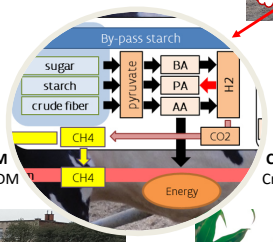
Introduction



Introduction

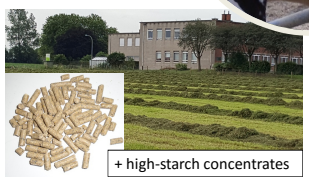
Grass silage

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

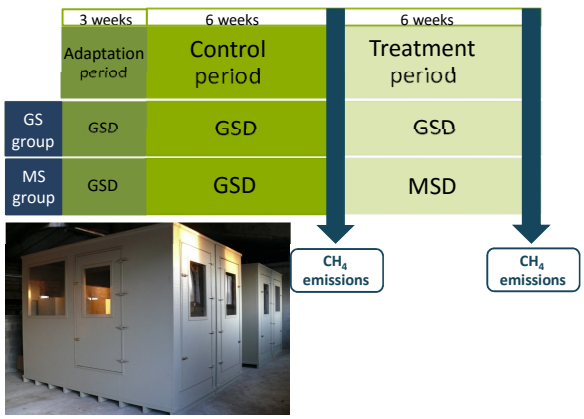


Materials and Methods

Diet 1 (GSD)	Diet 2 (MSD)
24% maize silage	44% maize silage
45% grass silage	24% grass silage
31% concentrates	32% concentrates

Animals
12 Holstein Friesian cows (4 in GS group + 5 in MS group)
103 ± 30 DIM (days in milk)
31,0 ± 3,1 kg milk/day

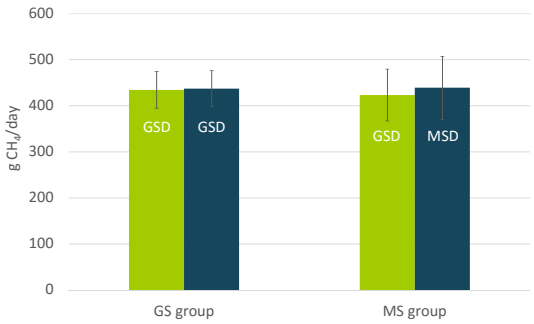
Materials and Methods



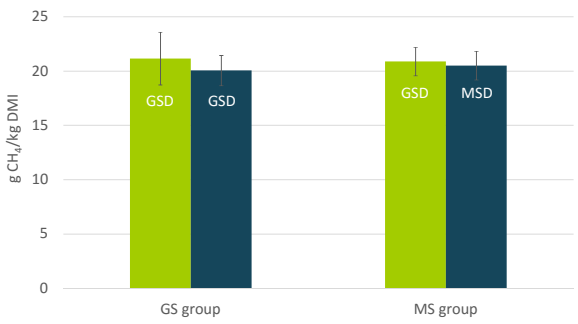
Results – nutrient intake

	GS group		MS group		Evolution
	GSD	GSD	GSD	MSD	MS group
DMI (kg/day)	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	

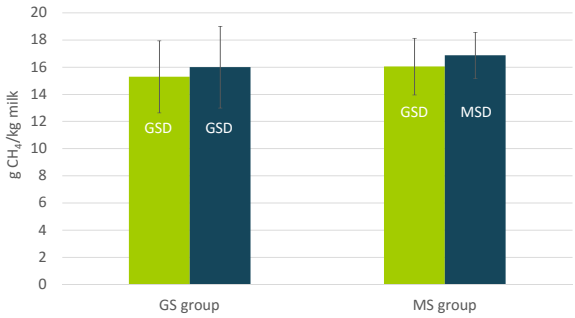
Results – g CH_4/day



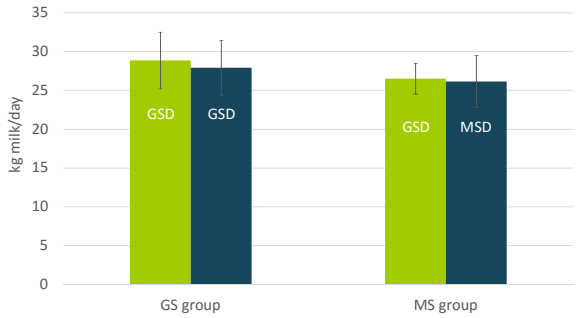
Results – g CH_4/kg DMI



Results – g CH_4/kg milk



Results – kg milk/day



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.

Discussion

- 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 … => specific concentrates
  - When feeding balanced diets, the MSD is not better than the GSD, when considering milk production and enteric CH_4 emissions
  - Total GHG emissions at farm or chain level can lead to a different overall outcome

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Thank you

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