

Postruminal digestibility of crude protein of maize and grass silages in dairy cows

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Need

- Assumptions and simple models
- Data available was not up to date
- Data on intestinal digestibility remain scarce
- Need for updated dataset on intestinal digestibility



Objectives

- Updated intestinal digestibility data of CP

Develop new regression equations to investigate the relationship between the chemical composition and the determined intestinal digestibility of CP



Variable	Maize silage (n=20)		Grass silage (n=20)	
	Minimum	Maximum	Minimum	Maximum
Chemical composition (g/kg DM)				
Dry matter (g/kg FM)	292	440	229	722
Ash	21	59	77	195
Crude protein	61	84	108	222
Crude fat	29	46	27	60
Starch	176	427	nd	nd
Sugar	8	22	12	246
Neutral detergent fiber	278	503	358	610
Acid detergent fiber	152	289	174	334
Acid detergent lignin	13	27	11	35
Silage quality parameters				
pH	3.80	4.40	3.90	6.20
NH3-N (g N/kg DM)	0.55	1.79	0.42	2.94

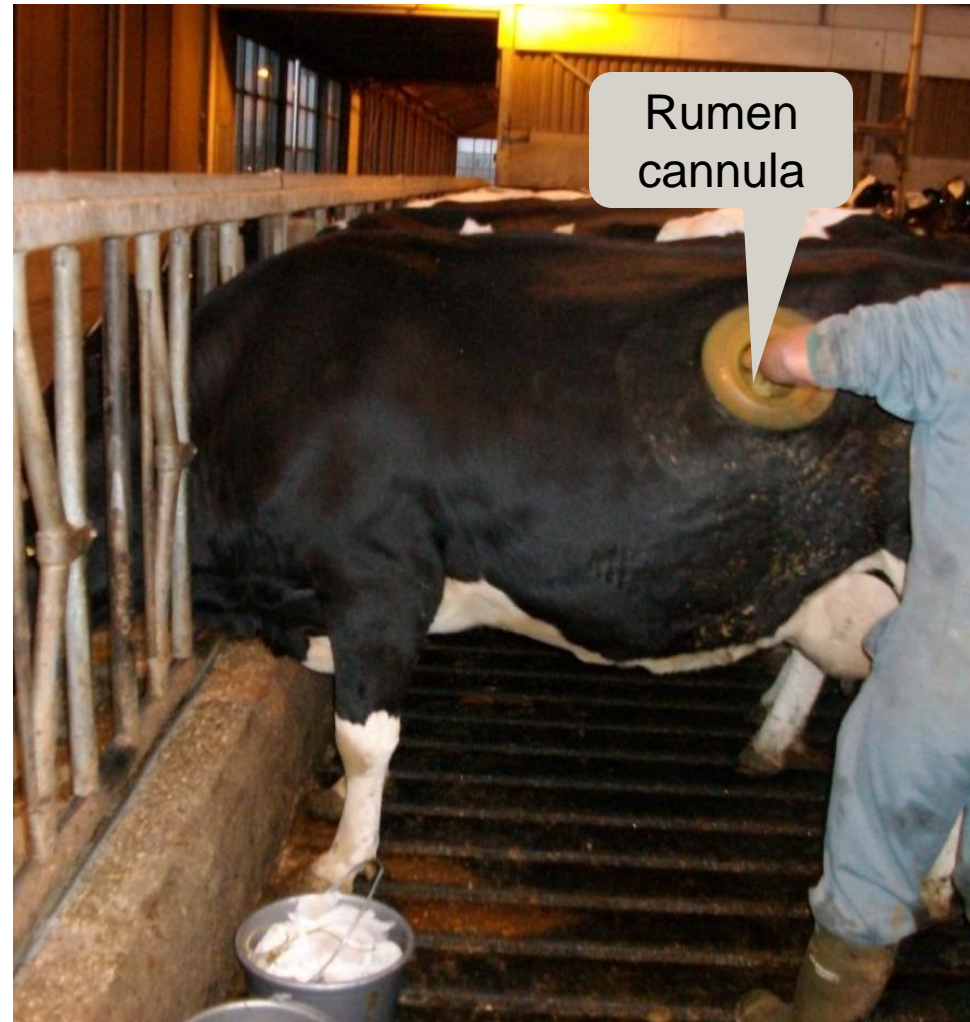
Methodology

In situ mobile nylon bag technique

- 1) Rumen incubations
- 2) Intestinal incubations

Rumen Incubations

- 5 g DM sample
- 12 h rumen incubation time
- Residues were freeze dried and ground



Methodology

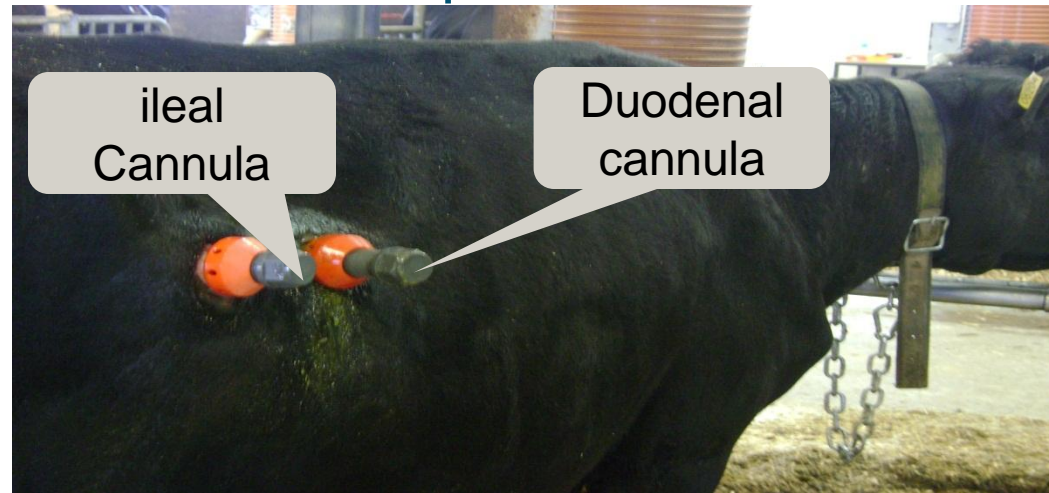
Pre-treatment

- 0.5 g rumen incubated residue in mobile nylon bags (MNBS)
- 0.04M HCl sol. for 1 h and after that in Pepsin-HCl sol. for 2 h

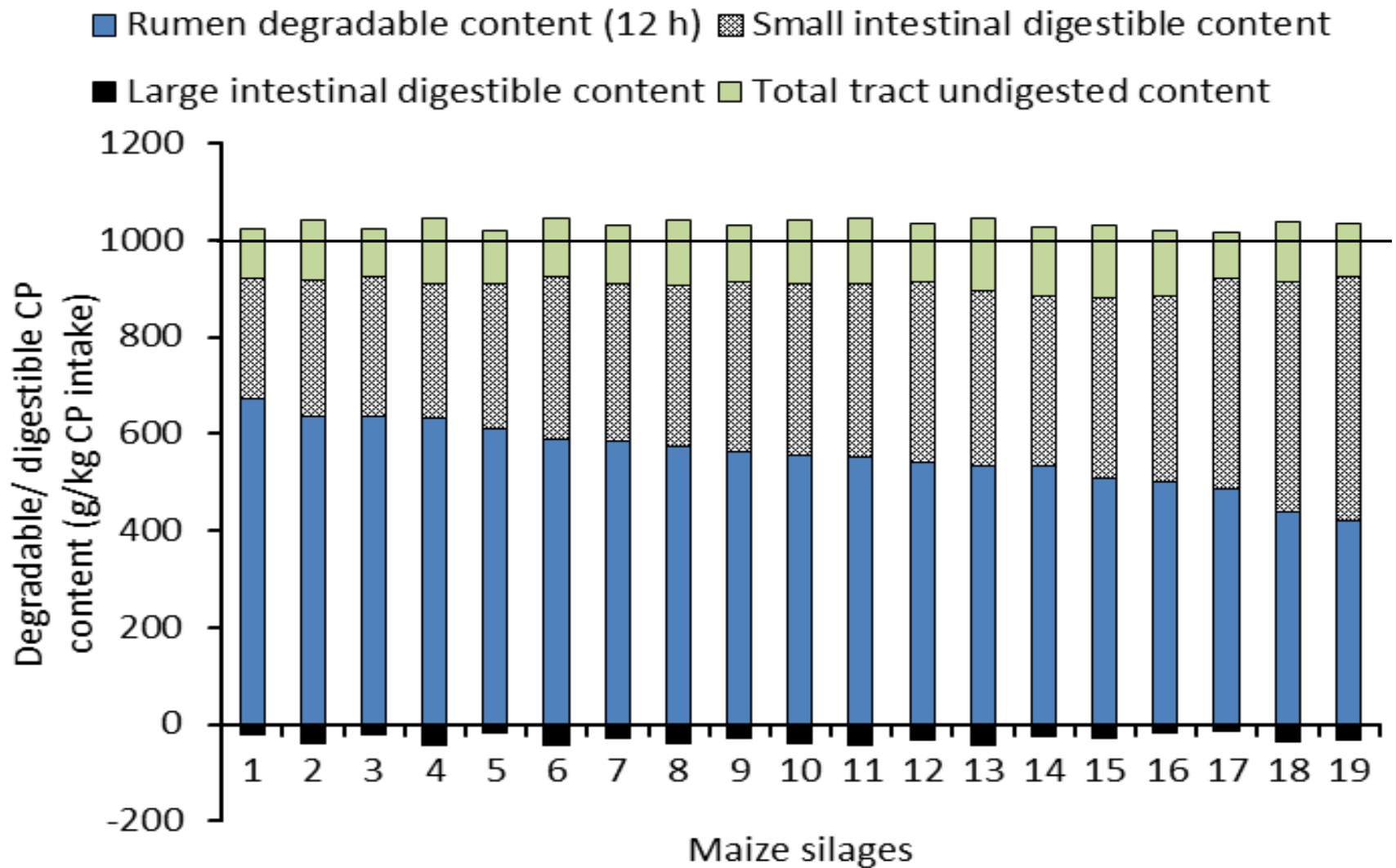
Intestinal Incubations

- 12 MNBs were incubated (4 bags / cow / sample)

- Collection:
ileal cannula and faeces

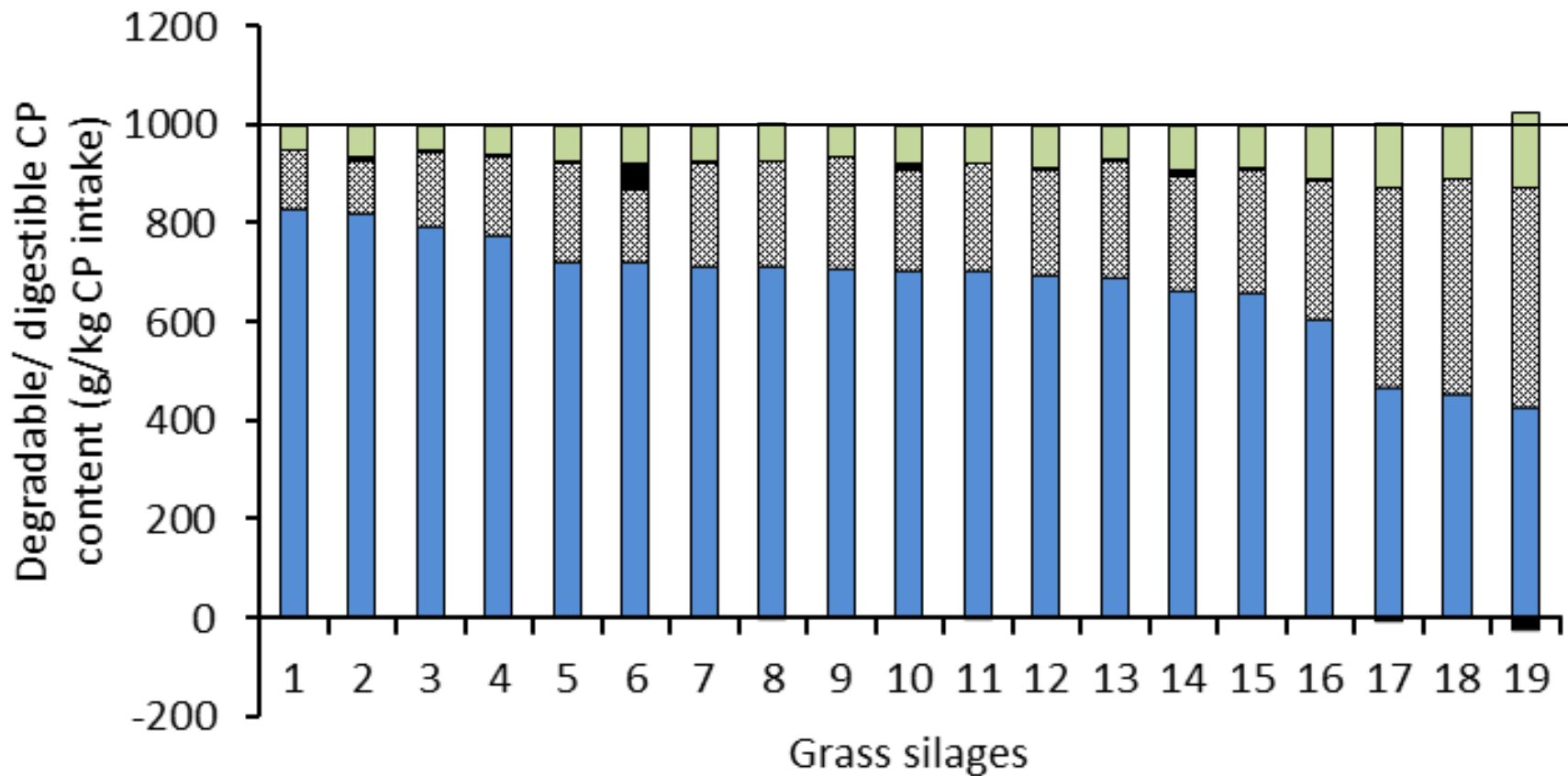


Results



Results

- Rumen degradable content (12 h)
- Small intestinal digestible content
- Large intestinal digestible content
- Total tract undigested content



Regression equations for rumen degradable (RD, g/kg DM), small intestinal digestible (SID, g/kg DM), large intestinal digestible (LID, g/kg DM) and total tract undigested content (TTU, g/kg DM) of crude protein based on chemical composition of maize and grass silages.

Maize silages	R²
RD = 118.76 - 0.14 DM - 0.19 ash - 1.21 ADL	0.688
SID = - 84.40 + 0.11 DM + 0.20 ash + 0.64 CP + 0.98 ADL	0.660
TTU = 4.44 + 0.15 sugar + 0.01 NDF	0.476
Grass silages	R²
RD = 94.05 + 0.70 CP - 0.19 NDF	0.865
SID = - 281.82 - 0.09 DM + 0.49 ash + 0.36 CP + 0.31 sugar + 0.45 NDF	0.720
LID = 51.11 + 0.02 DM - 0.07 ash - 0.03 CP - 0.08 sugar - 0.07 NDF	0.778

Conclusions

- Variation in the rumen degradability and intestinal digestibility
- Relationships was found between the chemical composition and determined intestinal digestibility



Acknowledgements



Thanks for your
attention

Questions

