Comparison of **urea** and **slow release urea**, supplied in 4 portions a day, on **performances** in high producing **dairy cattle**

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Session 43
Animal Nutrition

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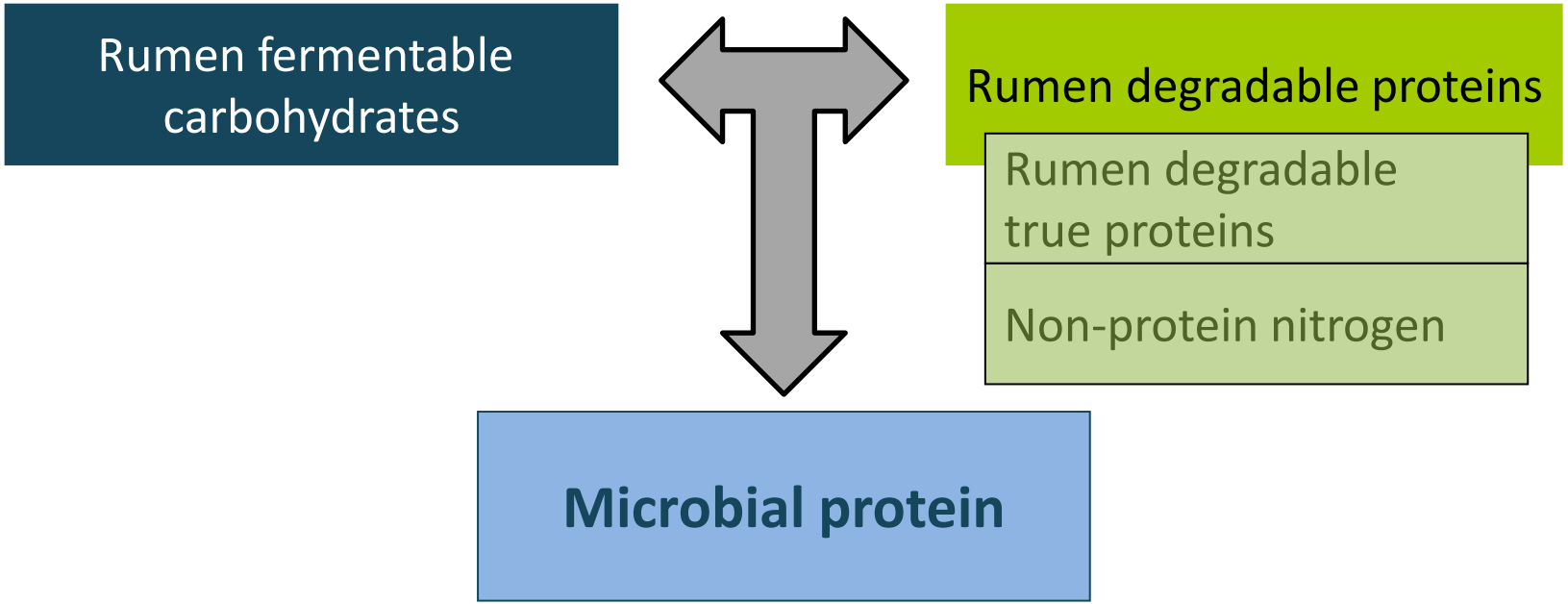
Background

Microbial protein: important protein source in (dairy) cattle



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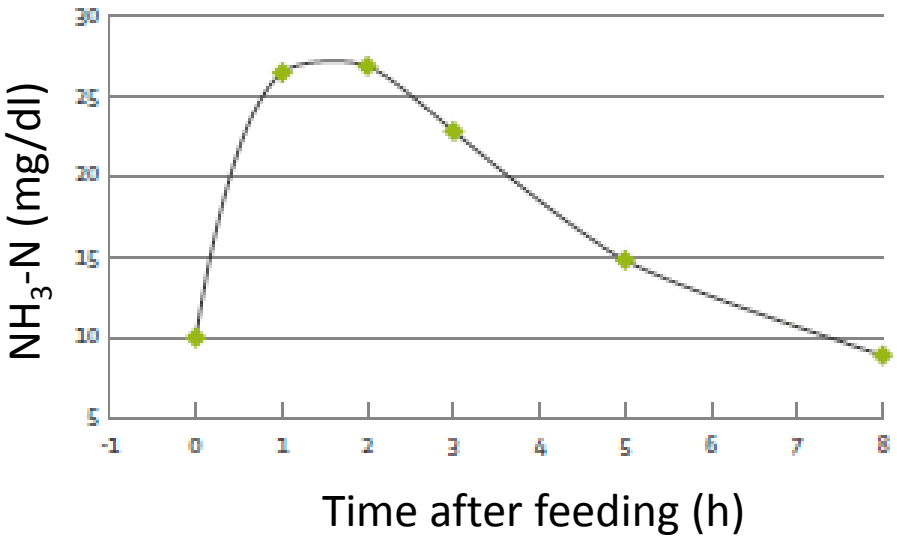

Rumen degradable proteins

Rumen degradable true proteins

Non-protein nitrogen

Background

Non protein Nitrogen sources

Feed urea => spreaded during the day

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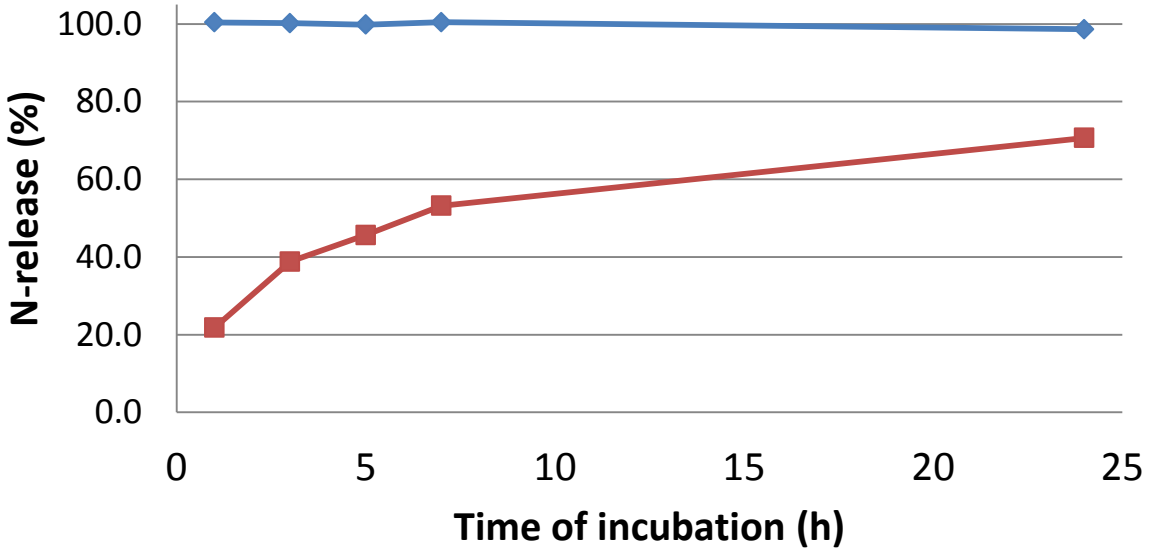
Background

Non protein Nitrogen sources

- Feed urea
- Slow release urea



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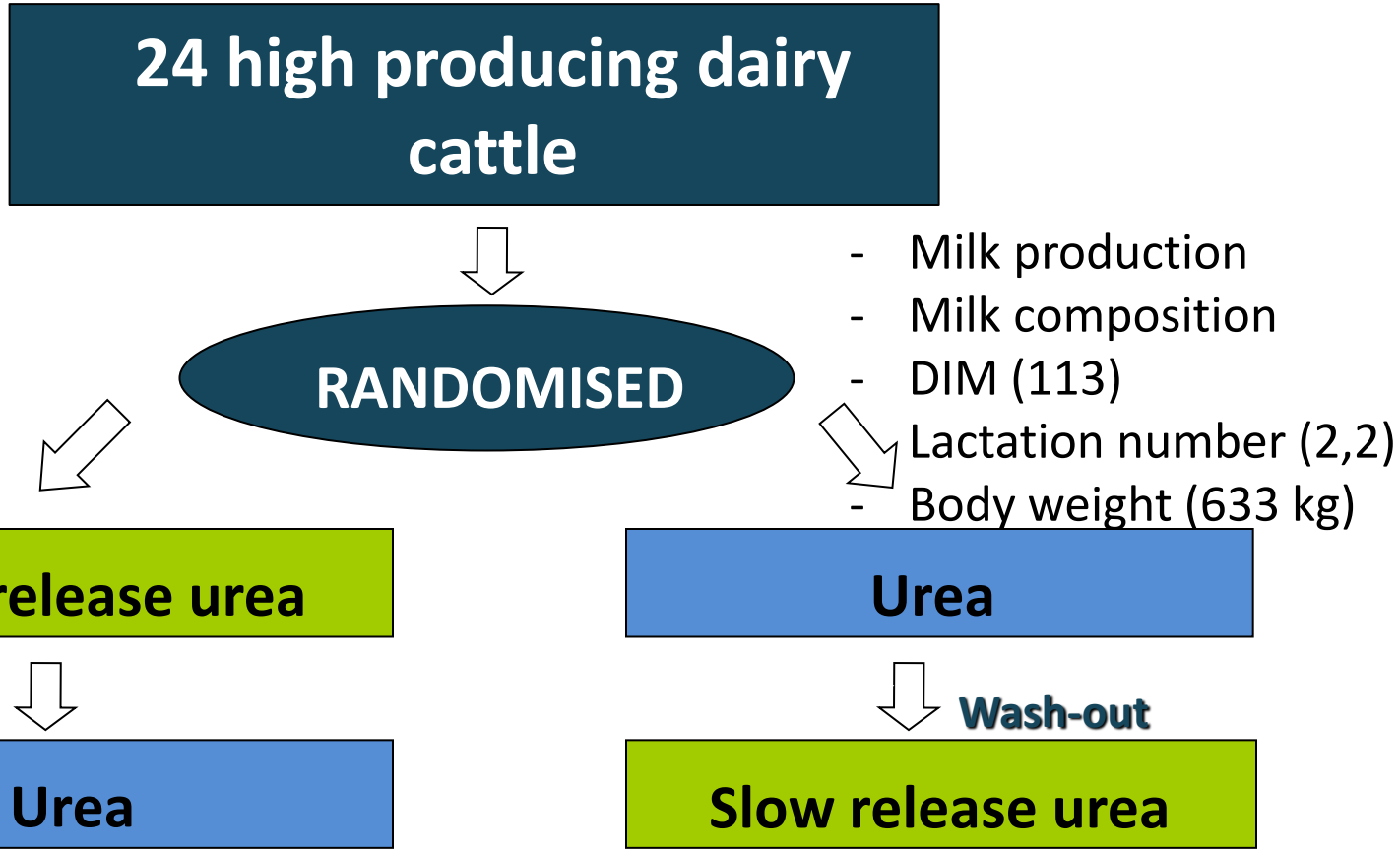
Aim of the study

- To compare to non protein nitrogen sources in high producing dairy cattle
  - Urea
  - Slow release urea

RESEARCH QUESTION

Does slow release urea provides extra benefits in a dispersed supply regime?

Cross-over design



Trial set-up

- Feedstuffs
  - Maize silage, prewilted grass silage, pressed beet pulp (60/30/10) ad lib
  - Concentrates (wheat, soybean meal and balanced concentrate)
- Individually formulated diet based on energy (105%) and protein (100%) requirements

Trial set-up

- Rumen degradable protein balance = 0

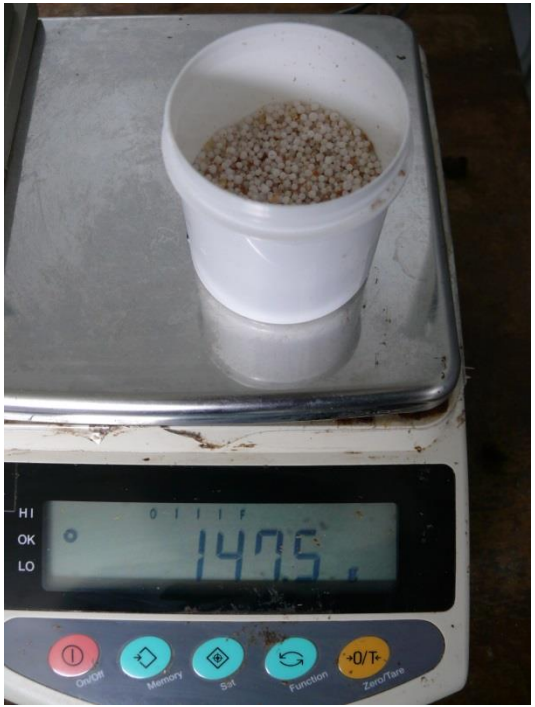
Control

Feed urea

Treatment

Slow release urea (Optigen®, Alltech)

⇒100 to max 228 g/ cow/ day



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Trial set-up

- Administration of urea sources
  - 4 portion a day (8 am, 12 am, 4 pm, 8 pm)
  - Manually mixed under the roughages in the bin

Statistics

- Data were analysed for normality and equality of variances (Levene's test)

- Feed intake and performance data were tested using
  General Linear Model
  treatment as fixed effect
  cow as random effect

Results Diet

g/kg DM	Control	Slow Release Urea	P-value
Crude fat	19.2 ± 0.2	19.1 ± 0.2	0.52
NDF	349 ± 4	350 ± 4	0.47
Starch	239 ± 5	240 ± 5	0.46
NE_l (MJ/kg)	6.1 ± 0.1	6.1 ± 0.1	0.64
DPI	67 ± 1	66 ± 1	0.20
Crude protein	**129 ± 2**	**127 ± 2**	**0.03**
RDPB	**3 ± 1**	**2 ± 1**	**0.01**

Results Feed Intake

	Control	Slow Release Urea	P-value
DMI (kg/day)	20.8 ± 0.6	21.3 ± 0.6	0.13
Roughage (kg/day)	**16.4 ± 0.4**	**16.8 ± 0.4**	**0.04**
Concentrate (kg/day)	4.5 ± 0.4	4.5 ± 0.4	0.95
DPI (g/day)	1414 ± 64	1419 ± 66	0.89
RDPB (g/day)	**63 ± 16**	**35 ± 14**	**0.01**
NE_l (MJ/day)	127 ± 4	130 ± 4	0.29

Results Performances

	Control	Slow Release Urea	P-value
Milk production (kg/day)	25.5 ± 1.5	25.8 ± 1.5	0.25
Fat (%)	4.41 ± 0.11	4.40 ± 0.09	0.80
Protein (%)	3.40 ± 0.07	3.41 ± 0.06	0.72
FPCM (kg/day)	26.6 ± 1.4	27.0 ± 1.4	0.32
MUC (mg/L)	198 ± 5	197 ± 5	0.76
Weight Δ (kg/day)	0.6 ± 0.2	0.5 ± 0.1	0.60
N-efficiency (%)	30.8 ± 0.6	31.3 ± 0.8	0.30

Discussion

- Positive effect SRU on milk production

e.g. Inostroza et al., 2010

=> 114 g SRU/cow/day in TMR (replaced soybean meal)

- True proteins => positive effect milk production

e.g. Brito et al., 2007 (dual paper)

=> 1,9% of feed urea (more than 400g)

=> compared with soybean meal, canola meal and cotton meal

Conclusions

RESEARCH QUESTION

Does slow release urea provides extra benefits in a dispersed supply regime?

- SRU increased roughage DMI
- Increased intake was not valorized by increased milk production

Thank you

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