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Grazing behaviour and intake of two Holstein cow types in a pasture-based production system

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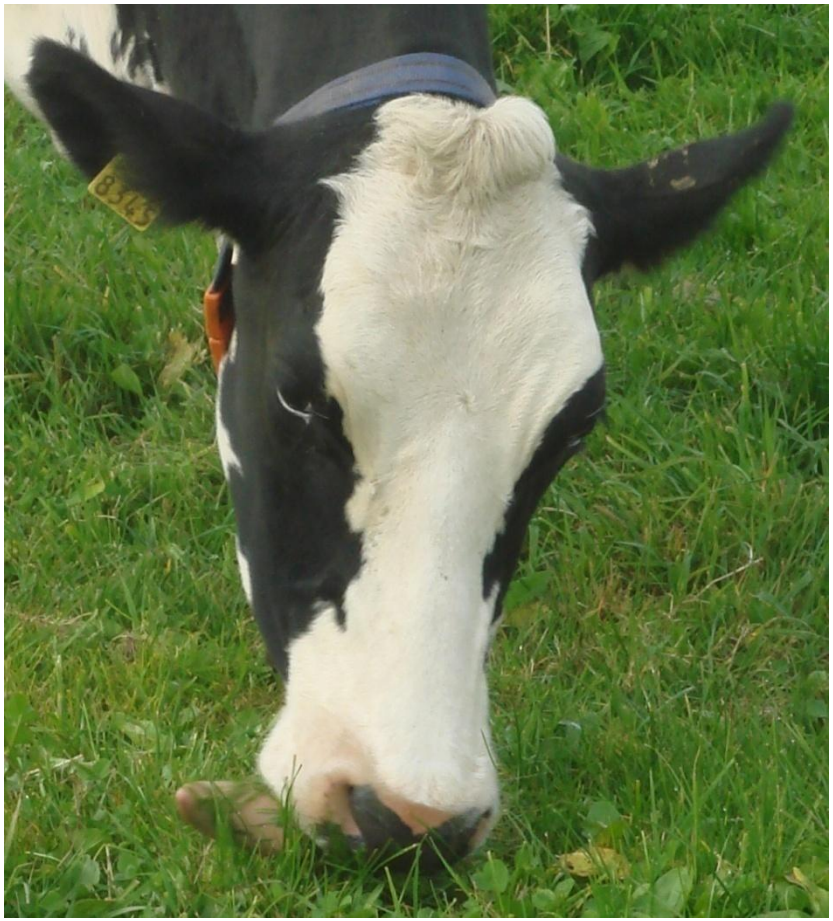
ALP is part of the ALP-Haras Unit

Overview

- Introduction
- Grass intake
- Grazing behaviour
- Physical activity
- Conclusions
- Questions



Why study grazing behaviour?

- Pasture-based production systems are
  - generally significant in Switzerland
  - of particular interest in organic milk production
- continuous increase of the milk production per cow and lactation
  - Holstein: 8313 kg milk (3.97% fat & 3.26% protein / www.holstein.ch)
- Dairy cows eat less on pasture compared to TMR

	Full-grazing		TMR		P		
	NZ	OS	NZ	OS	G	D	GxD
Cows	14	14	13	14			
Liveweight [kg]	470	512	536	597	**	***	-
Intake* [kg DM/d]	16.6	17.3	20.4	24.0	t	***	*

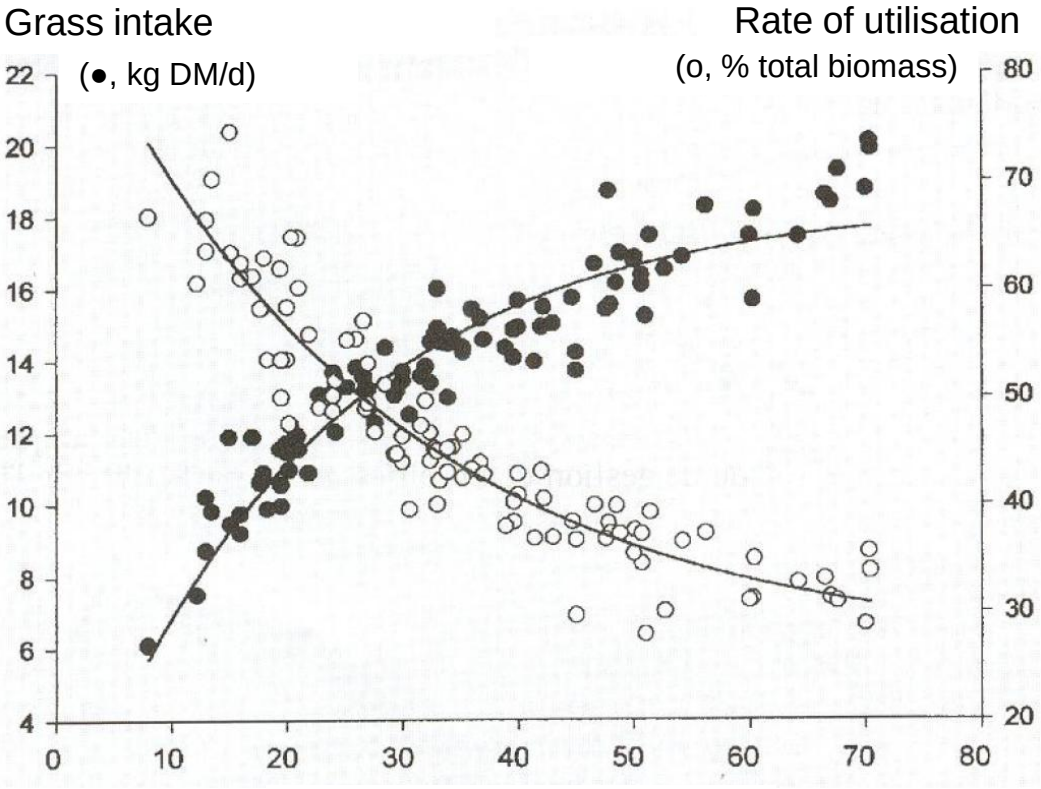
*at early lactation

(Kolver et al. 2002)

NZ = New Zealand Holstein Friesians, OS = overseas Holstein Friesians
G = genotype, D = diet, GxD = Interaction genotype x diet
Significant : t $P<0.10$ * $P<0.05$, ** $P<0.01$,*** $P<0.001$

Why study grazing behaviour?

- Maximise intake decrease the use of biomass on pasture



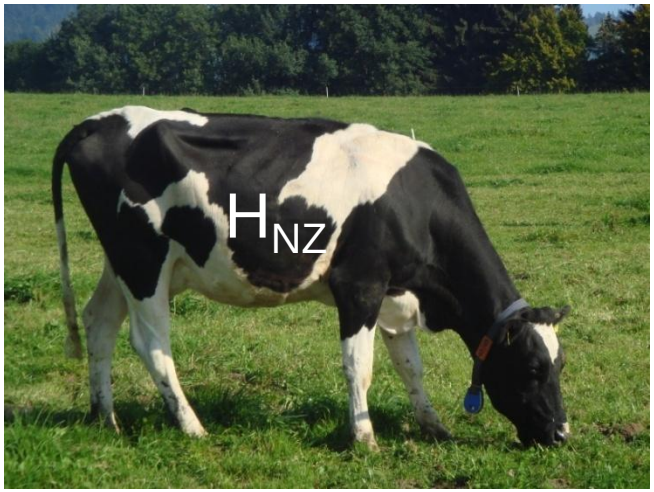
(Delagarde et al. 2001)

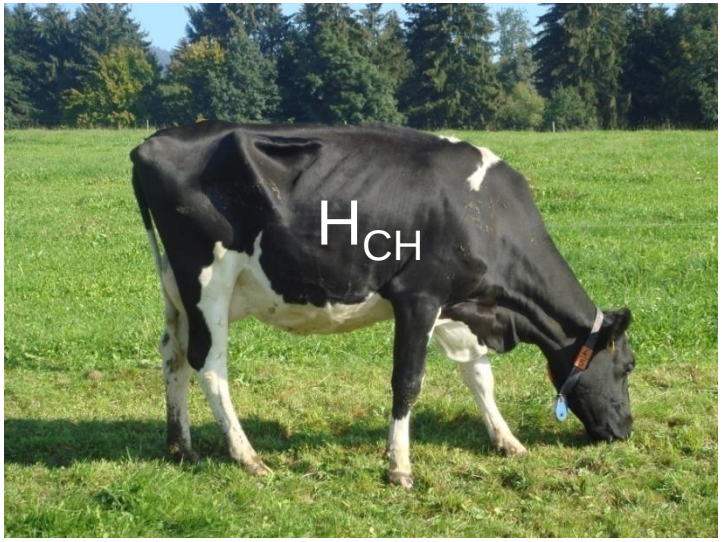
Why study grazing behaviour?

- Grazing behaviour & intake are affected by Holstein strains *(McCarthy et al. 2007)*
  - NZ strain had the longest grazing time
- Knowledge about intake & grazing behaviour ⇨ improve utilisation of grown herbage ⇨ increase system efficiency

Grass intake: animals, materials & methods

- Organic farm “L’Abbaye” in Sorens (824 m a.s.l., Switzerland)
- 2 Holstein cow types
  - 11 New Zealand Holstein cows (H_{NZ})
  - 11 Farm-bred “Swiss” Holstein cows (H_{CH})
- Intake was estimated twice during first & second lactation
  - Double marker method with n-alkanes *(Mayes et al. 1986)*





Grass intake: results

	N	H_{CH}	H_{NZ}	se	P
Days in milk [d]	80	113	134	3.0	***
Energy corrected milk [kg]	80	21.0	18.1	0.5	***
Live weight [kg]	80	605	506	6	***
Grass intake [kg DM]	80	17.5	15.5	0.4	**
Total intake [kg DM]	80	18.8	16.1	0.4	***
Grass intake/$BW^{0.75}$ [kg $100kg^{-1}$]	80	14.3	14.5	0.3	-
Total intake/ $BW^{0.75}$ [kg $100kg^{-1}$]	80	15.4	15.0	0.3	-
ECM/total intake[kg kg^{-1}]	80	1.14	1.15	0.03	-

*p>0.1; ** p<0.01, ***p<0.001; standard error (se); metabolic body weight ($BW^{0.75}$); energy-corrected milk (ECM),*

- H_{NZ} had lower grass and total DM intake per cow
- No intake difference per kg of metabolic body weight
- No difference in milk yield per kg of DM intake

Grazing behaviour: animals, materials & methods

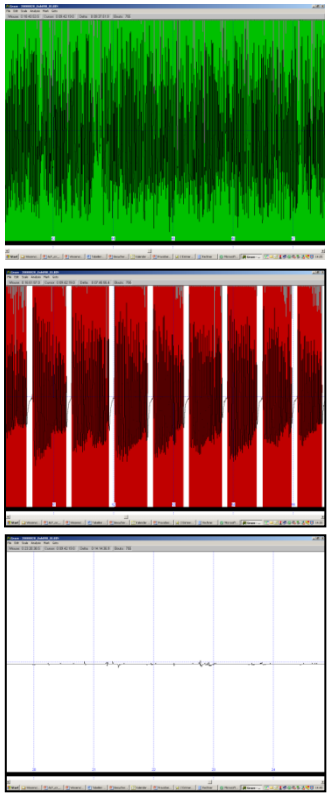
IGER Behaviour Recorder

(Rutter *et al.* 1997)

grazing

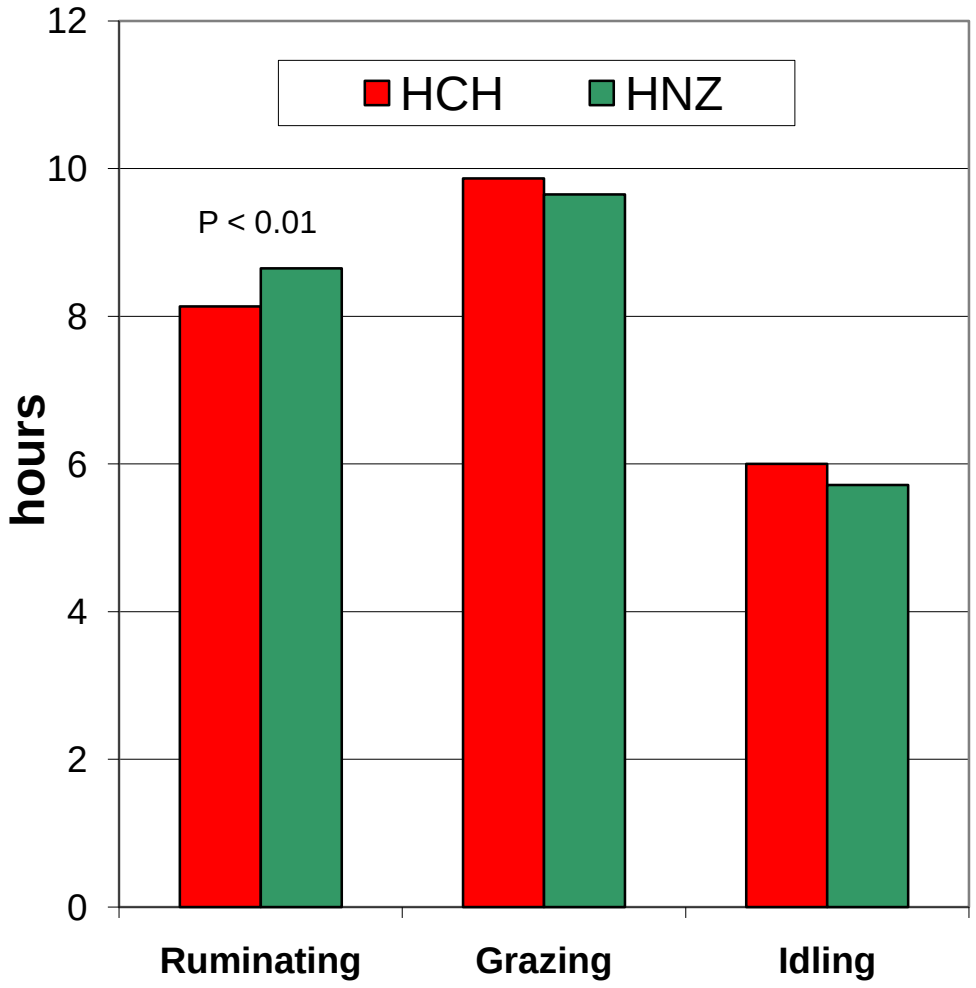
ruminating

idling



- Same measurement period as intake, but 2 weeks
  - per week 3 cow pairs were equipped during 4 days

Grazing behaviour: results



Grazing behaviour: results

	N	H_{CH}	H_{NZ}	se	p
No. ruminating mastications d^{-1}	46	33138	35364	620	*
No. of boli d^{-1}	46	571	595	19	-
No. ruminating mast. $boli^{-1}$	46	60	61	2	-
No. prehension bites d^{-1}	46	37680	33317	1024	**
No. prehension mast. d^{-1}	46	6708	8872	579	*
Total no. prehension d^{-1}	46	44389	42190	725	*

*- p>0.1; * p<0.05; ** p<0.01; standard error (se)*

- H_{NZ} longer rumination time & no. ruminating mastications d^{-1}
- H_{NZ} fewer prehension bites & more mastications per d^{-1}
- No differences related to grazing and idling time

Physical activity: materials, methods & results

- Pedometer simultaneously with behaviour recorder
- Data collected only 2008

	N	H_{CH}	H_{NZ}	se	p
No. steps d^{-1}	22	4035	4459	143	t
Standing & walking [min d^{-1}]	22	951	890	23	t
Walking [min d^{-1}]	22	350	381	17	-
Laying [min d^{-1}]	22	489	551	23	t

- p>0.1; t p<0.1; standard error (se).

Conclusions

- H_{NZ} compared to H_{CH} behave slightly differently, with
  - longer rumination time
  - fewer prehension bites and more mastication during grazing
- No differences in intake per kg of $BW^{0.75}$ and in feed efficiency
- Differences in grazing behaviour might be of interest, if utilisation of grown herbage could be improved.

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