AHDB DAIRY

The University of Nottingham

UNITED KINGDOM · CHINA · MALAYSIA

Non-invasive indicators of rumen function and stress in dairy cows

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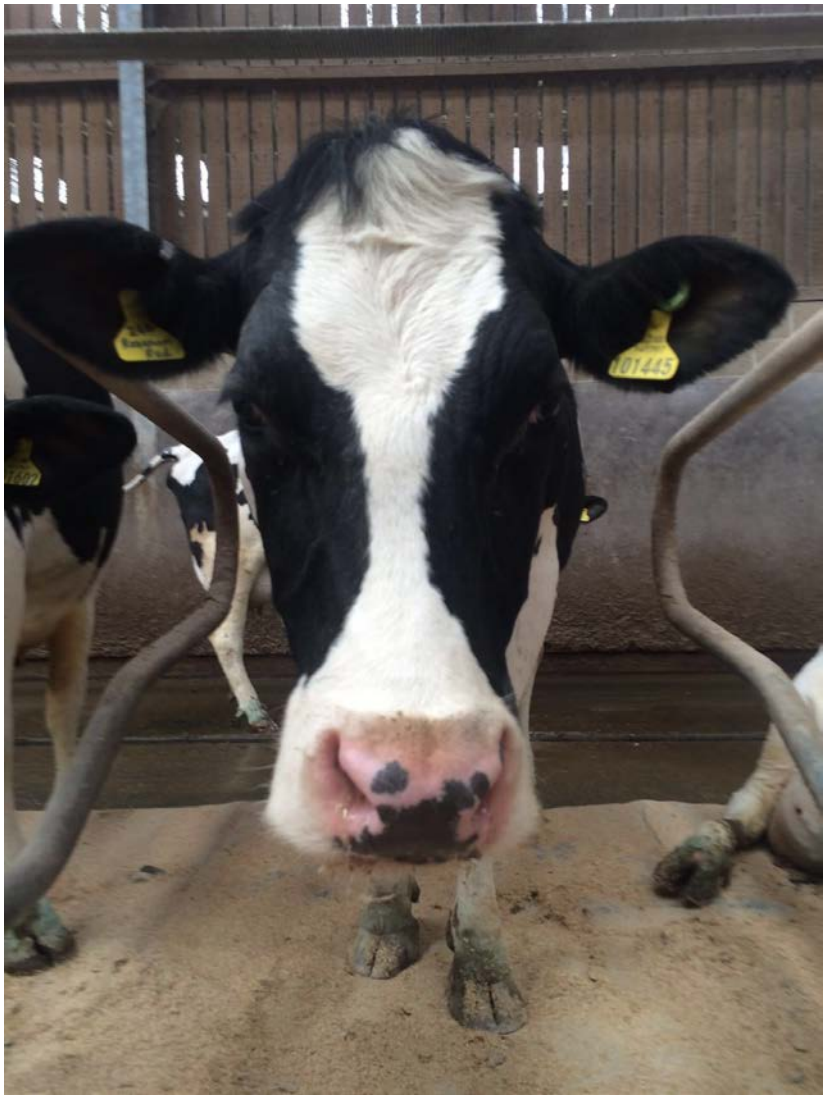
AHDB Dairy



Potential stressor?

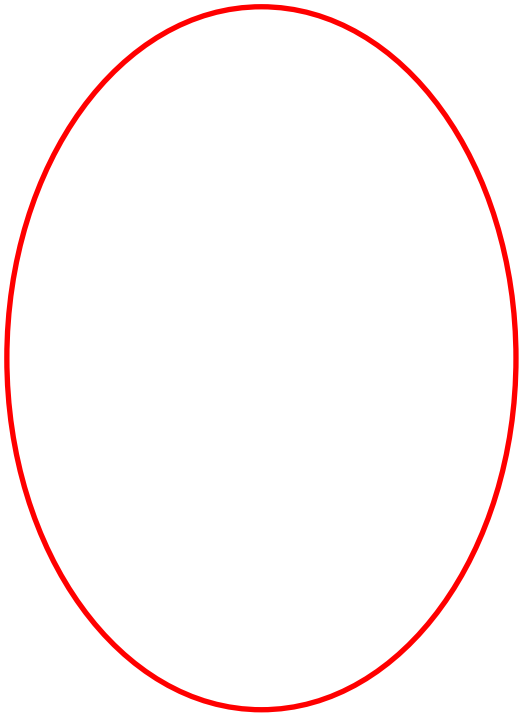
- Dietary change might cause a stress response in the cow that might be reflected by changes in faecal glucocorticoid concentration.
- A change in diet composition, how does this affect rumen function and performance, if at all?
- We investigated effects of diet change on non-invasive indicators of rumen function and stress.

- Faecal sampling- faecal glucocorticoids
- 10 to12 hours after stressor

- Milk Yield
- Rumination rate

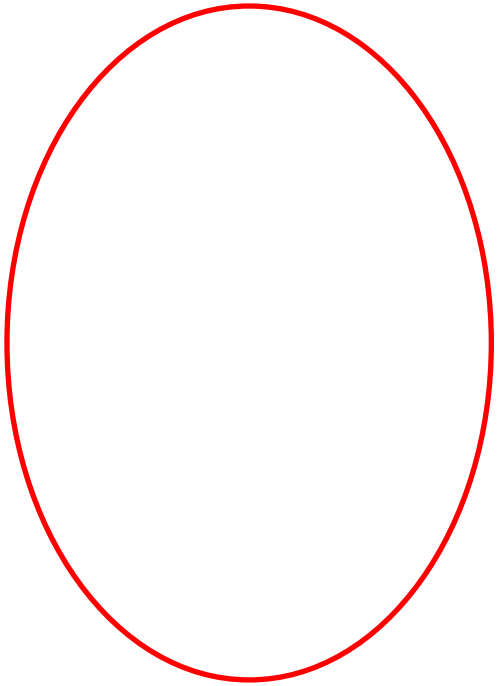
- Dry matter intake
- Digestibility
- Methane emissions

Response to mild stressors



P<0.001

Response to mild stressors



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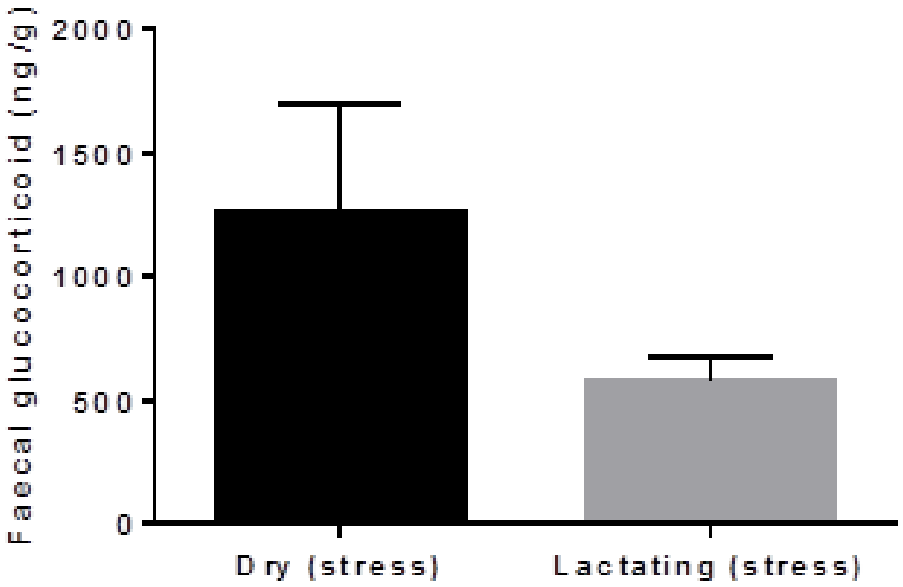
Response to stress: Dry Cow vs Lactating Cow

Stressor = Foot Trimming



Before stress (P=0.083)

After stress (P=0.238)

(n=5 cows per treatment)

Response to diet changes

	Period					
	1	2	3	4	σ	P
Faecal Glucocorticoids (ng/g)	300	585	691	876	240.9	<0.05
Rumination time (min/d)	423	430	415	390	17.5	0.53
Milk yield (kg/d)	37.8	36.1	33.9	29.0	3.8	0.74
DMI (kg/d)	24.3	22.2	22.0	22.0	1.13	0.98
Faecal AIA (g/kg)	37.8	36.9	41.3	40.6	2.12	0.95
Methane (g/d)	373	448	425	471	42.0	0.57

No effect of diet.
Period effect suggests potential cumulative response to diet changes on faecal glucocorticoids

Response to diet changes (Silage trial)

	Period						
	1	2	3	4	5	σ	p
Faecal Glucocorticoids (ng/d)	129	154	189	238	170	41.1	0.16
Rumination (min/d)	339	438	433	436	433	43.1	0.99
Milk Yield (kg/d)	43	43	39	38	39	2.5	0.35
Methane (g/d)	339	328	359	360	362	15.2	0.38

P 1-3 silage batch changes
P 4- Inclusion of straw and decrease of molasses
P 5 – Compact feeding

Forage changes and composition had no effect on factors outlined

Conclusions so far…

- Method validated - detects mild stress events
- Differences in stress response indicator in dry vs lactating cows
- Diet change Trial 1 ... Period effect not Diet effect. Interesting … cumulative effect or artefact of experiment?
- Faecal glucocorticoids not associated with rumen function, intake or milk yield
- Routine changes in farm silage batch … no response in faecal glucocorticoids

*** Further work will confirm if period and/or dietary changes are repeatable in raising faecal glucocorticoids ***