Comparing green biorefinery press cake as a replacement feed for silage in cows

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BIOREFINERY GLAS

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CARBERY

Grassa GREEN REFINED SOLUTIONS

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Feeding value of feed stuffs

Chemical composition (% of DM)	1st cut Grass silage	Press cake
DM (%)	29.9	37.4
Crude Protein	16.4	10.9
NDF	49.1	74.1
ADF	28.9	41.3
WSC	4.3	3.6
Ash	9.8	4.2
Phosphorus	0.42	0.39
Gross energy (MJ/kg of DM)	17.7	18.3

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Experimental treatments

	Grass silage	Press Cake
Grass silage	14 kg DM	5 kg DM
Press cake silage	-	9 kg DM
Standard concentrate	7.2 kg DM	7.2 kg DM
Soya bean meal	0.44 kg DM	0.44 kg DM

Animal feeding study:

- ✓ **30 autumn calving early lactation Holstein Friesian dairy cows** (70 days in milk, 31kg/day, 4.3% fat, 3.7% protein)
- ✓ **77 days: 14 days acclimatisation + 63 days experimental period**
- ✓ **Measurements: daily dry matter intake**, **milk production** and **composition**, **rumen fermentation parameters**, **metabolic status**, **N&P balance**

Experimental treatments

Chemical composition (% of DM)	Grass Silage	Press Cake
DM (%)	41.18	48.63
Ash	10.04	6.75
Crude Protein	18.02	15.22
NDF	37.33	56.94
ADF	22.52	27.07
WSC	4.61	2.25
Starch	3.55	4.42
Phosphorus	0.46	0.44
Ether extract	4.68	2.55
Gross energy (MJ/kg of DM)	17.98	18.15

Results animal feeding study:
the effect of treatment on DMI and feed efficiency

Item	Treatment		SEM	*P*-value
	Grass Silage	Press Cake		
DMI				
PMR (kg DM/d)	15.73	14.40	0.342	0.010
Total (kg DM/d)	19.33	18.00	0.342	0.010
N intake	0.71	0.60	0.035	<0.01
P intake	0.095	0.089	0.0001	<0.01
Feed efficiency	1.31	1.27	0.024	0.241

Results animal feeding study: the effect of treatment on milk yield and milk composition

Item	Treatment		SEM	*P*-value
	Grass Silage	Press Cake		
Milk production (kg/d)				
Milk yield	28.02	27.33	0.724	0.510
Fat	1.27	1.17	0.031	0.032
Protein	0.96	0.94	0.019	0.341
Milk solids	2.24	2.11	0.046	0.055
Milk quality %				
Fat	4.58	4.35	0.133	0.243
Protein	3.47	3.44	0.071	0.799
Urea (% mg/l)	0.027	0.024	0.0007	0.008
SCC (cells/ml)	27	29	3.613	0.064
ECM (kg)	25.63	22.64	0.894	0.025

FINDINGS: animal feeding study

Press cake *versus* grass silage <u>significant effects</u>:

↓ **Rumen ammonia concentration**

↑ **Higher proportion of feed N excreted in milk and faeces and no effect on urinary N**

↓ **N&P excretion**

↑ **Nitrogen use efficiency**

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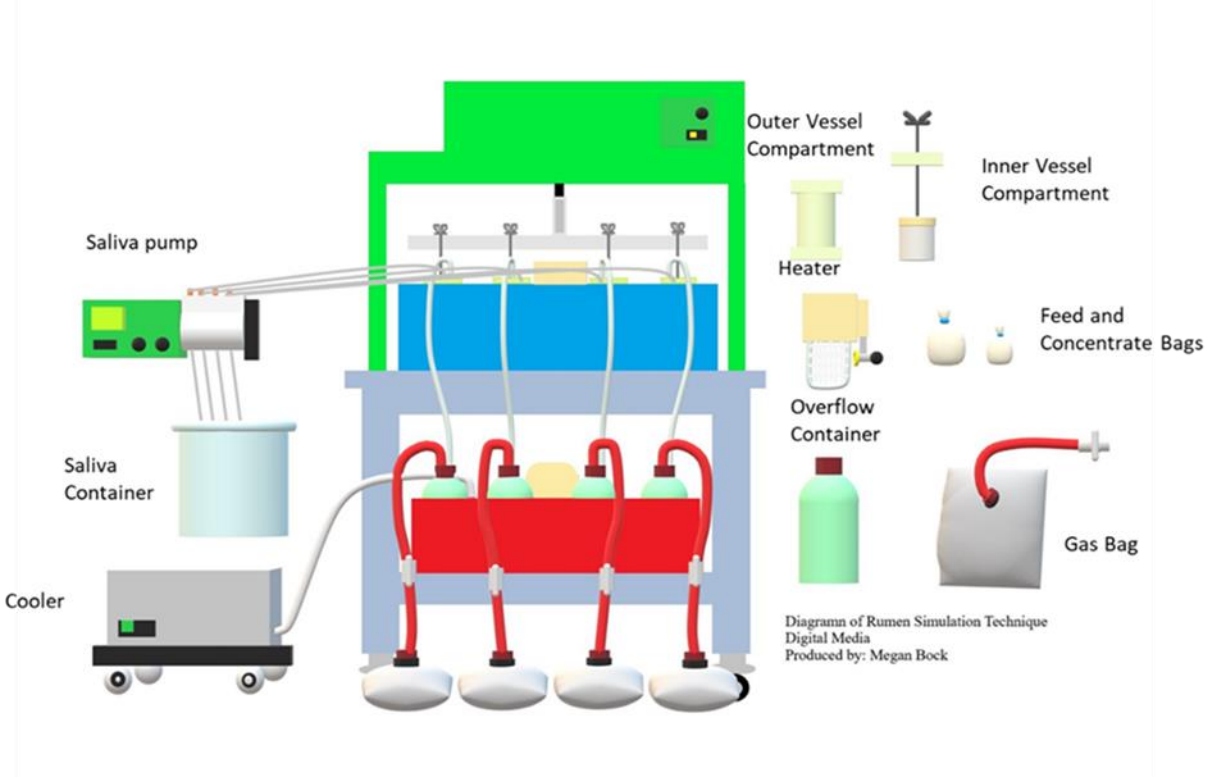
In vitro **study (RUSITEC):**

- ✓ **Same two dietary treatments**
- ✓ **18 days incubation: 10 days acclimatisation period + 8 days experimental period**
- ✓ **Measurements: *in vitro* apparent digestibility, pH, *in vitro* fermentation parameters, *in vitro* total gas** and **methane production**



FINDINGS: *in vitro* study

Press cake *versus* grass silage – <u>trends towards</u>:

- **Apparent digestibility**
- **Rumen ammonia concentration**
- **Total gas production**
- **Methane production**

CONCLUSION

- ✓ **Press cake silage has the potential to partially replace grass silage in the diet of early lactation dairy cows**
- ✓ **Reduction in N and P excretion and increase in NUE indicate that press cake silage has the potential to offer an environmental mitigation strategy in ruminant systems**
- ✓ **Further research required with higher quality standing grass crop and clover/ multispecies containing swards**

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