

The effect of grass white clover and grass only swards on milk production and grazing behaviour

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Introduction

- **Irish dairy farmers have shown renewed interest in reintroducing white clover in grassland as a consequence of the limitations on N fertiliser use under the Nitrate Directive**
- **White clover inclusion in swards can make an important contribution to the sustainability of ruminant production systems (Peyraud et al., 2009) due to its ability to fix atmospheric nitrogen (N)**

Introduction

- **Mixed grass white clover swards with high N fertiliser are highly productive but fertiliser application can reduce sward clover content (Ledgard and Steele, 1992)**
- **Frequent grazing can enhance clover productivity in mixed swards (Black et al., 2009)**
- **Grass clover swards can increase cow voluntary DMI by 15% and consequently increase milk yield production by 12% compared to grass only swards (Ribeiro Filho et al., 2003)**

Objective

- **To compare milk production and grazing behaviour from lactating dairy cows grazing grass only (GR) or grass white clover (GC) swards**

Materials and methods

Material and Methods

Swards

- Two swards of were sown in May 2010 (Dairygold Research Farm, Teagasc Moorepark)
 - Grass (GR)
 - Grass clover (GC)

- Swards received 250 kg N/ha

Material and Methods

- 30 cows randomly allocated to graze each sward
→ grazed from 17th April until 30th October
- Rotational grazing
 - Strip grazed
 - Daily allocation
- DM allowance
 - 16 kg DM herbage/cow/day
 - 1 kg concentrate/cow/day



Material and Methods

Measurements

- Pre grazing herbage mass (2 × week)
- Sward clover content (2 × week)



Material and Methods

- **Milk production**
 - **daily**

- **Milk components analysis**
 - **fat, protein and lactose**
 - **weekly – am and pm milking**



Grazing Behaviour Recordings

- **Eight lactating rumen-fistulated dairy cows were arranged into four 2×2 Latin squares**
- **Allocated to each treatment for one period of two weeks**
- **Same Latin Square design in two time stages**
 - **May - TS1** **July – TS2**

Grazing Behaviour Recordings

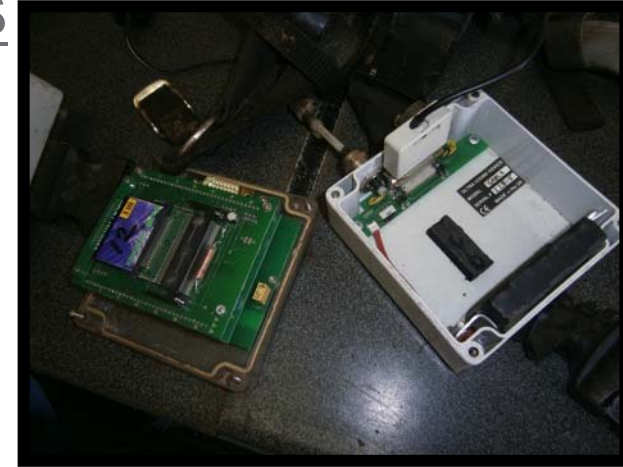
- Each period has 10 days for acclimatisation and 4 days of data collection



Material and Methods

Grazing Behaviour Recordings

- **Cows were fitted with IGER behaviour recorders (Rutter et al., 1997)**
- **The proportion of time spent grazing, ruminating and idling was measured**



Statistical Analysis

- **PROC MIXED (SAS)**
- **Fixed Effects:**
 - **Treatment, Time and Treatment*Time**
 - **Milk = week**
 - **Herbage mass = rotation**

Results

Results

Pre-Grazing Herbage mass and Milk production (17th April to 30th October)

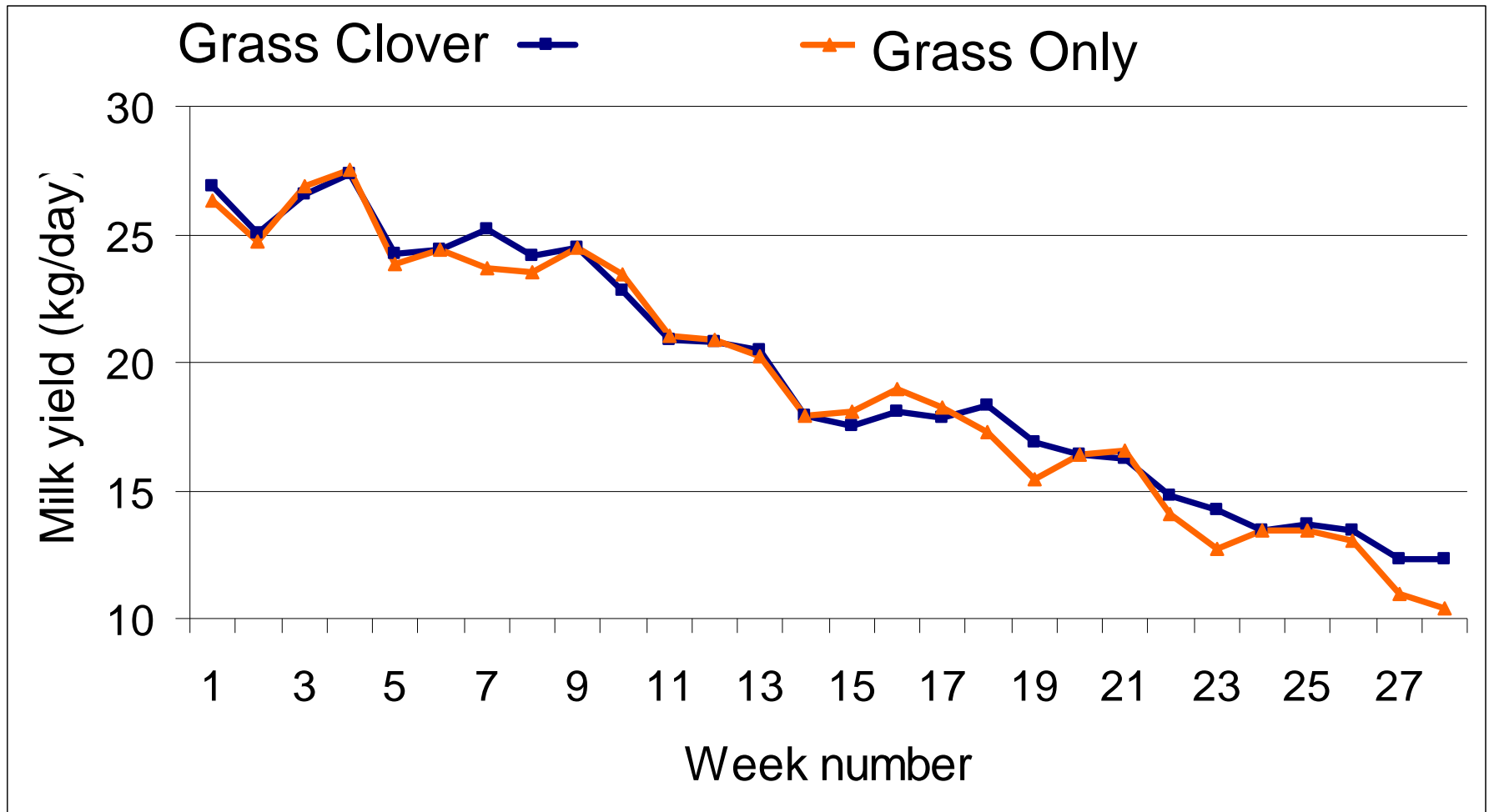
	Grass Only	Grass Clover	SEM	P value	
				Treat	Treat ×Time ₁
Pre-grazing herbage mass (kg DM/ha)	1709	1730	46.3	NS	NS
Milk yield (kg/day)	19.2	19.5	0.23	NS	***
MS yield (kg/day)	1.50	1.50	0.002	NS	***
Fat (g/kg)	43.7	42.5	-2.8%	0.08	***
Protein (g/kg)	36.3	36.4	0.06	NS	***
Lactose (g/kg)	46.1	45.9	0.14	NS	***

Significance; *** = P<0.001; *P<0.05; NS = Non significant

¹Herbage mass = Rotation; Milk variables = Week

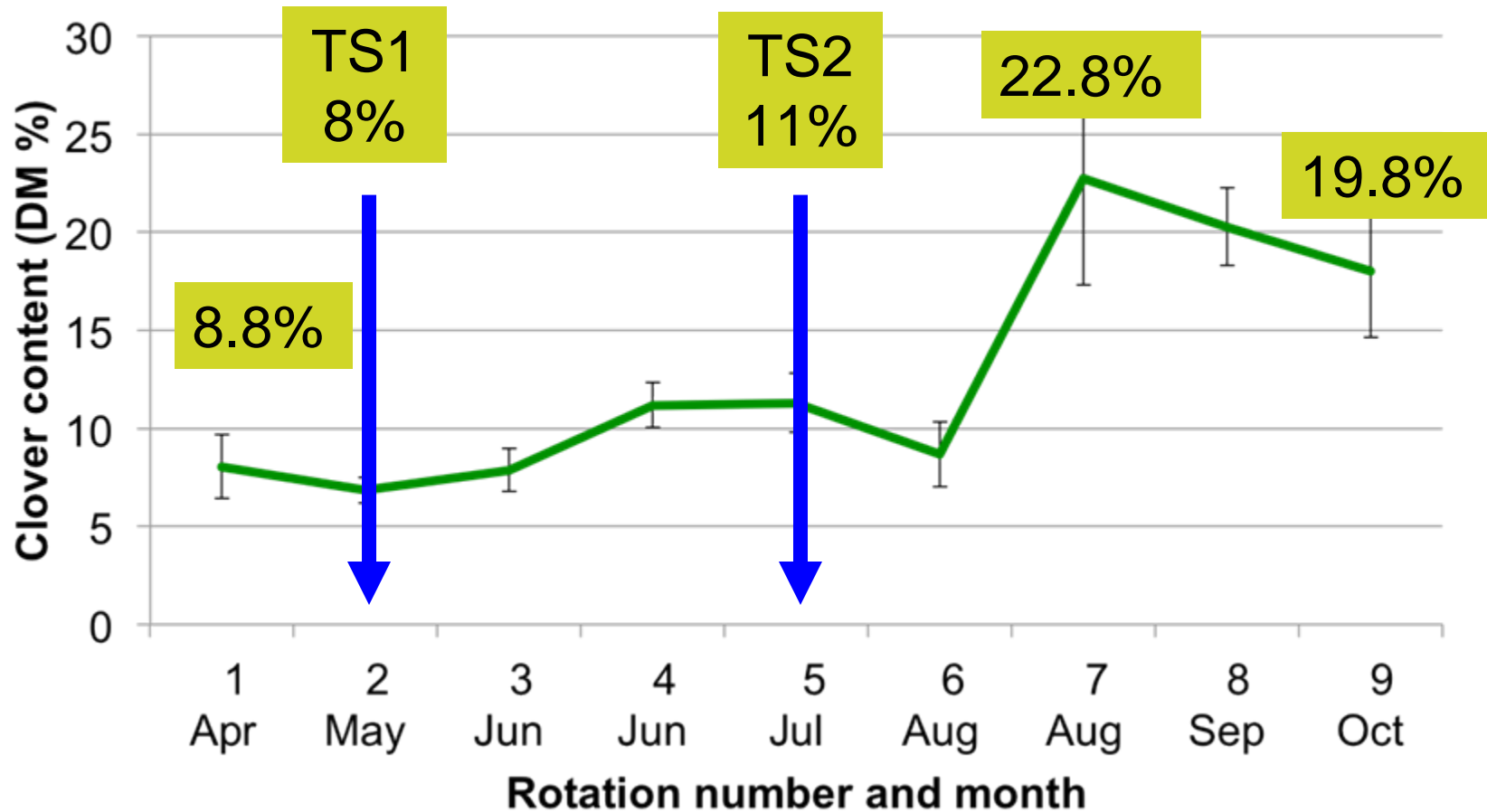
Results

Milk production (17th April to 30th October)



Results

Clover content



Results

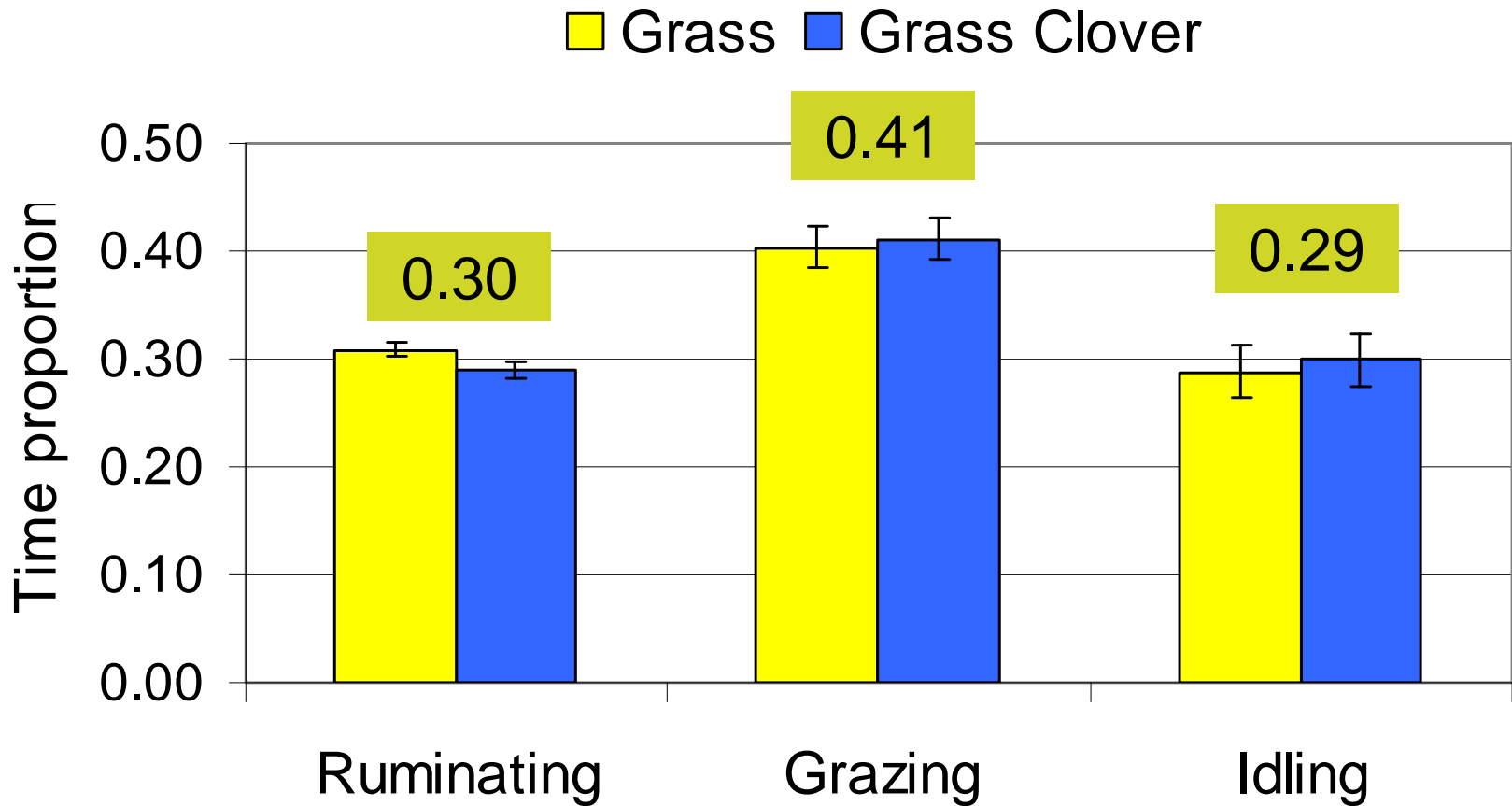
Clover content

- The average clover content of the GC swards was low 0.13.



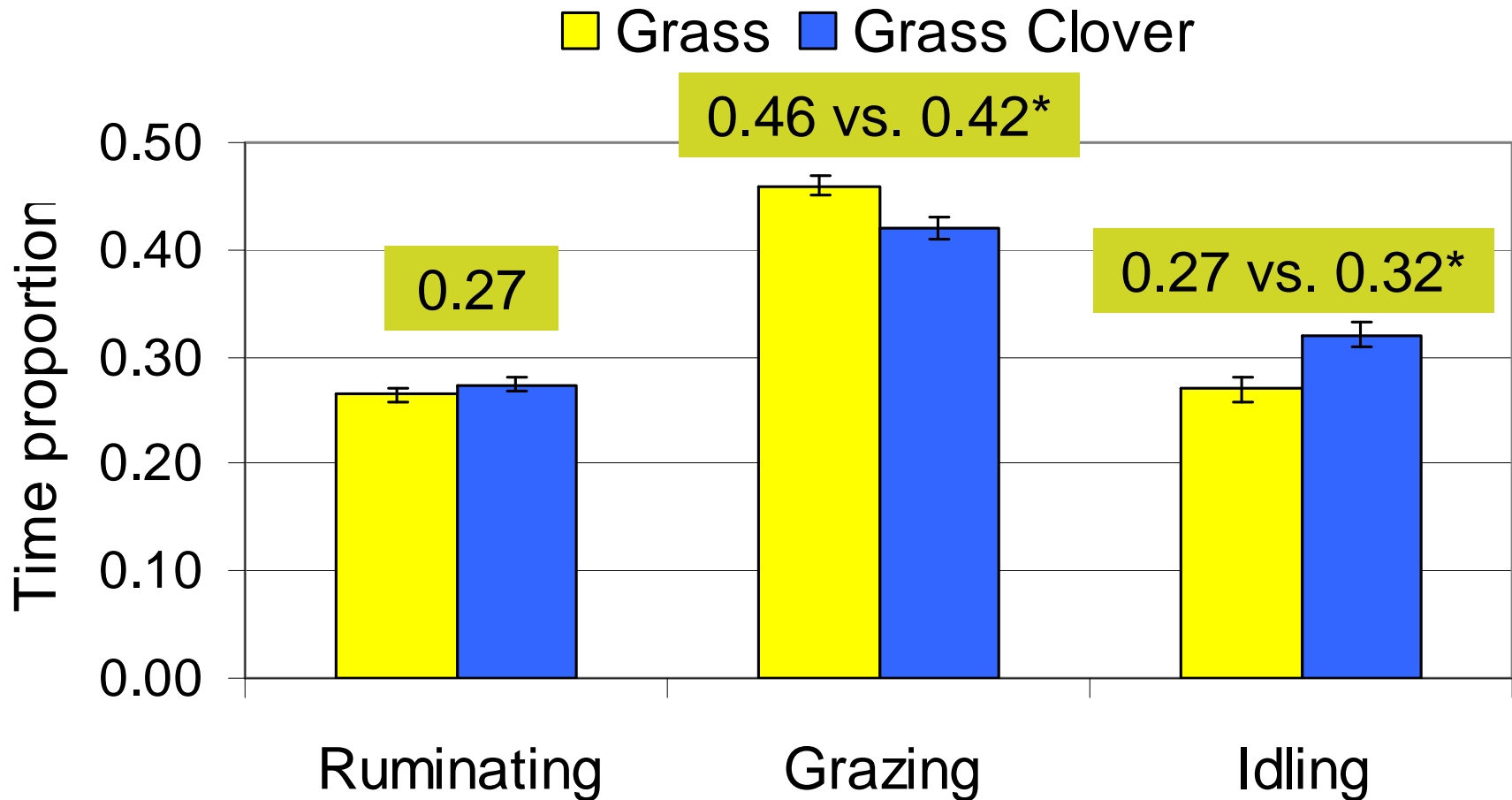
Results

Grazing behaviour TS1 (May)



Results

Grazing behaviour TS2 (July)



*P<0.05

Discussion

Milk Production

- **Cows grazing clover grass swards can produce more milk than cows grazing grass only swards receiving no N application (Peyraud et al., 2009; Ribeiro filho et al., 2003; Wilkings et al., 1994)**

Clover content

- **Higher than values observed (3%) in a previous experiment with similar environmental conditions and N application level (248 kg N/ha; Humphreys et al., 2008)**

Conclusions

Conclusions

Grass clover swards had similar herbage and milk production to grass only swards

Grazing behaviour was only affected when higher clover proportions were present.

Clearer differences between treatments may be observed if sward clover content was greater through the year

Acknowledgements

Teagasc Walsh Fellowship Scheme

Dairy Levy Fund

MULTISWARD (FP7-244983)

DAFM/TEAGASC/UCD EEAP bursary

Thanks for your attention

Any questions???

