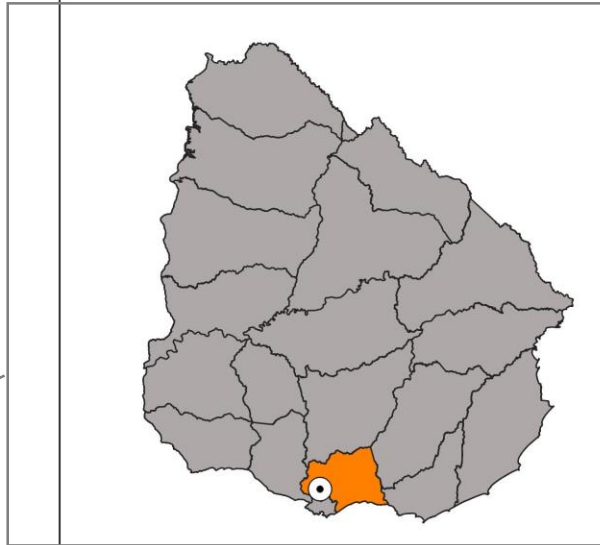


# Initial and residual sward height on high stocking rate dairy grazing system on a farmlet desing



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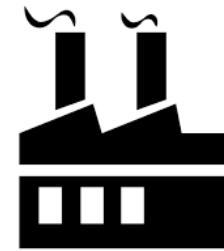




3.3 million



3873 dairy farms



2026 millions of milk produced per year



800.000



Grazing systems  
perennial pastures  
and annual grasses

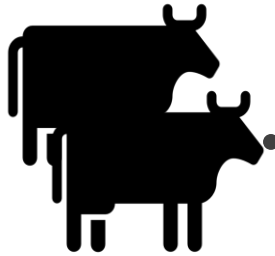


# Dairy production in Uruguay



- Growth of milk production (5% annual) DIEA, 2015

- Increases of N° of cows/per hectare and individual production (Chilibroste 2015)



- Intensive grazing systems with higher amount of grass harvested exhibited lower cost per kg of milk produced (Dillon et al., 2005, Chilibroste et al., 2011)



- 70% the milk is exported (INALE, 2017) = COMPETITIVE

- Pasture persistence

Study the effect of stocking rate and pasture management on: grass production, grass phenologic stage and sward height.



# Methodology

24   
Cows/Treatment

16 Ha Platform

12 Ha Platform

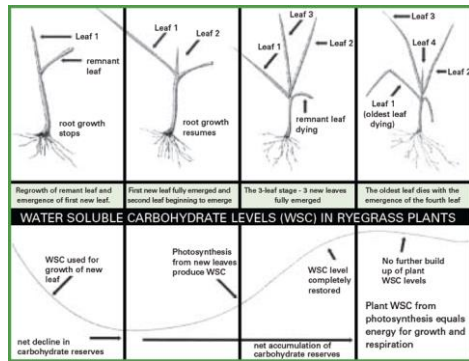
- **Four farmlet** grazed from 2017-2018 March till December
- **Grazing rotation** three years perennial pasture, one annual grasses
- Sward mass and mean growth rate (GR,kgDM/ha/day) of each individual plot in each farmlet **was assessed weekly**



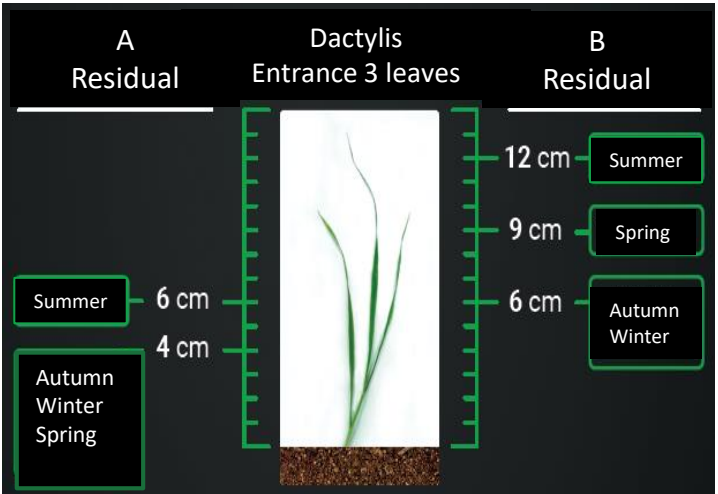
  
1,5 cows/ha

  
2,0 cows/ha

- Daily herbage height (cm) was measured
  - Pre- grazing
  - Post grazing
  - N° leaves expanded



Donaghy DJ, Fulkerson WJ (1999)



1,5 A

1,5 B

2,0 A

2,0 B



# Results

| Pre-grazing height | P -value |
|--------------------|----------|
| Treatment          | 0.0079   |
| Season             | 0.0196   |
| Treatment*season   | 0.0590   |

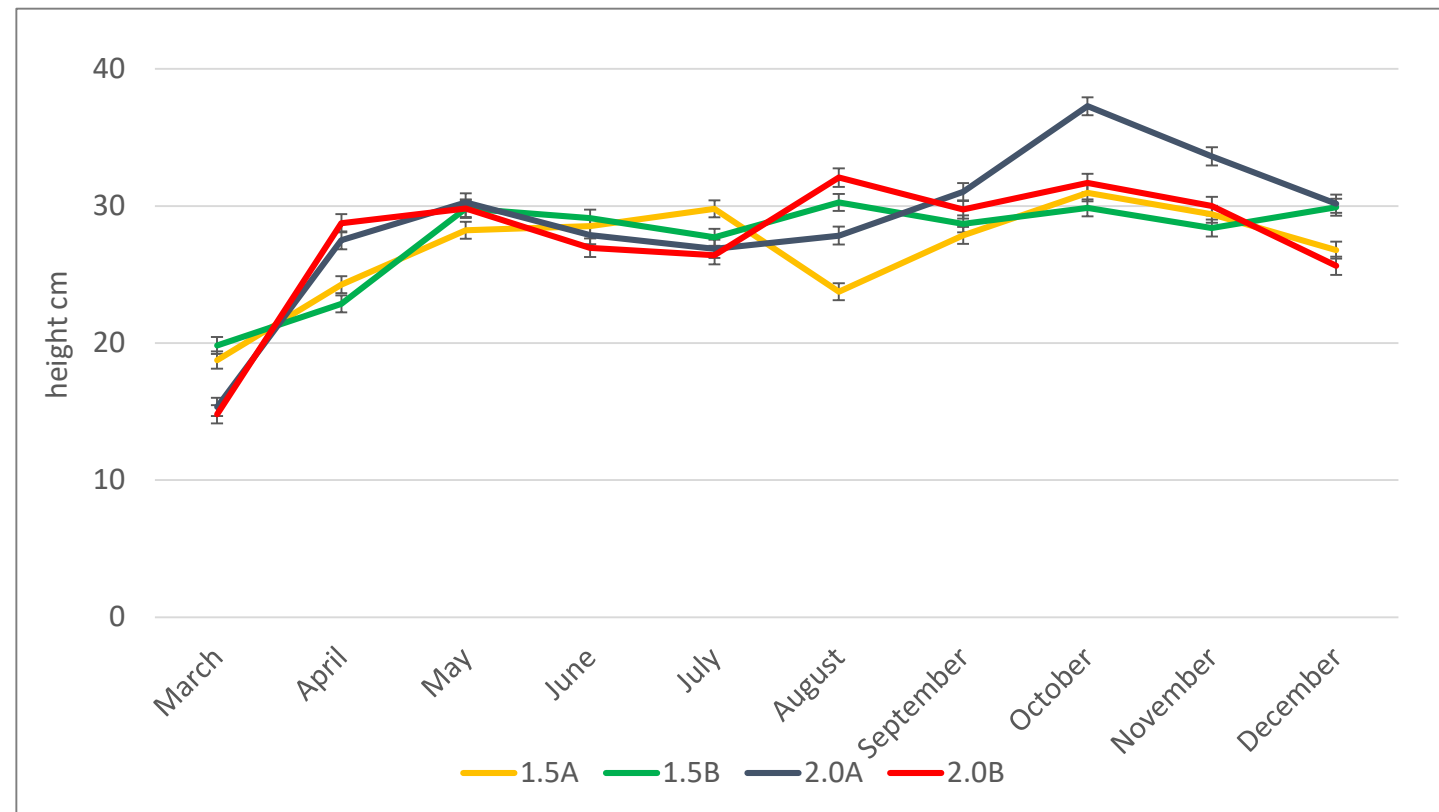
| Pre-grazing height | Estimate |
|--------------------|----------|
| Autumn             | 26.7 b   |
| Winter             | 28.5 ab  |
| Spring             | 31.1 a   |

Differences were declared significant when  $P < 0.05$  by Tukey HSD test

|              |   |
|--------------|---|
| <b>1,5 A</b> | <b>28.0 <math>\pm</math> 0.6 <u>b</u></b> |
| <b>1,5 B</b> | <b>28.6 <math>\pm</math> 0.6 <u>b</u></b> |
| <b>2,0 A</b> | <b>30.1 <math>\pm</math> 0.6 <u>a</u></b> |
| <b>2,0 B</b> | <b>28.4 <math>\pm</math> 0.6 <u>b</u></b> |

Differences were declared significant when  $P < 0.05$  by Tukey HSD test

## Pre-grazing height (cm) temporal distribution





**1,5 A**

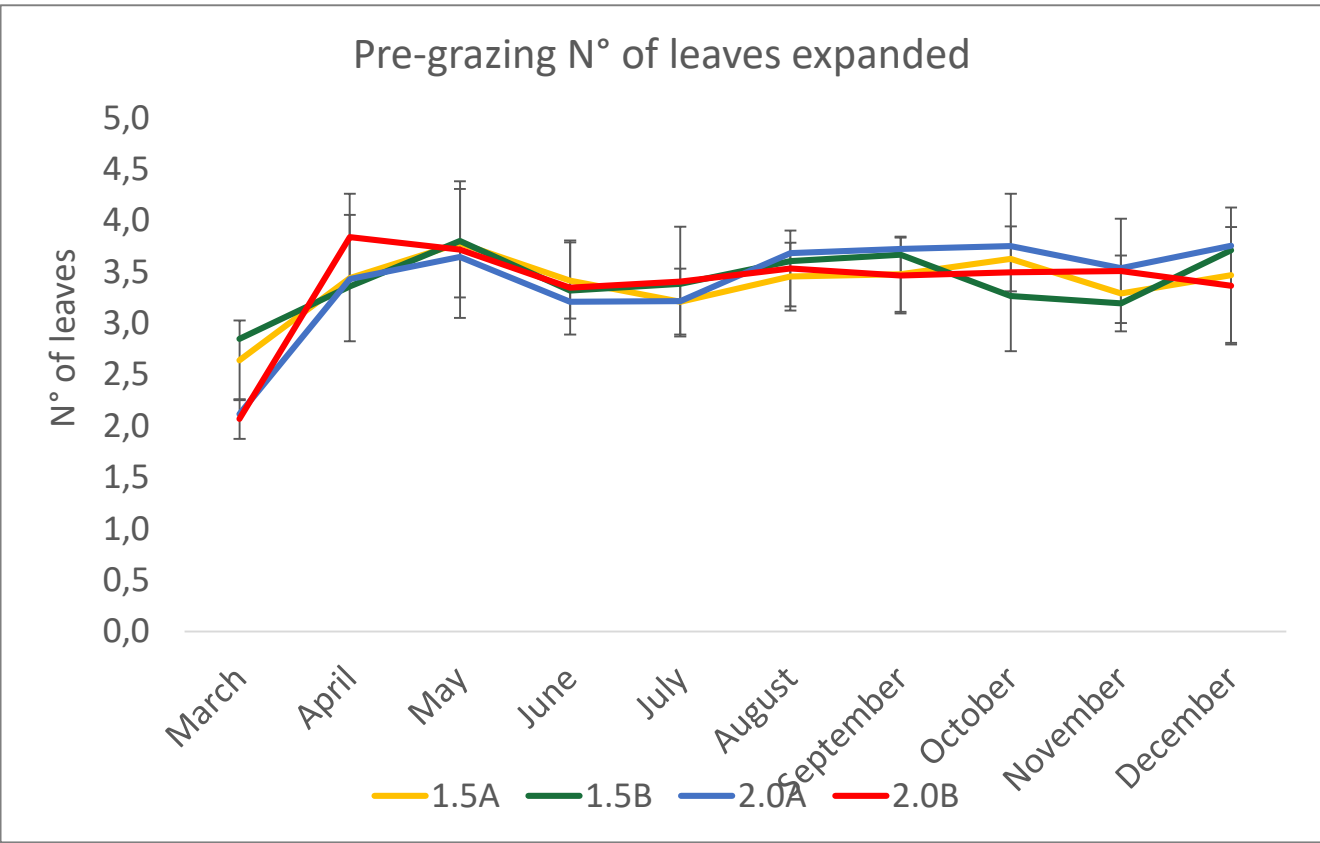
**1,5 B**

**2,0 A**

**2,0 B**

|              |              |              |              |               |
|--------------|--------------|--------------|--------------|---------------|
| N° of leaves | 3.41 ± 0.4 b | 3.41 ± 0.1 b | 3.48 ± 0.1 a | 3.42 ± 0.1 ab |
|--------------|--------------|--------------|--------------|---------------|

Differences were declared significant when P < 0.05 by Tukey HSD test



# Herbage mass



**1,5 A**

**1,5 B**

**2,0 A**

**2,0 B**

Initial sward mass  
Kg DM ha

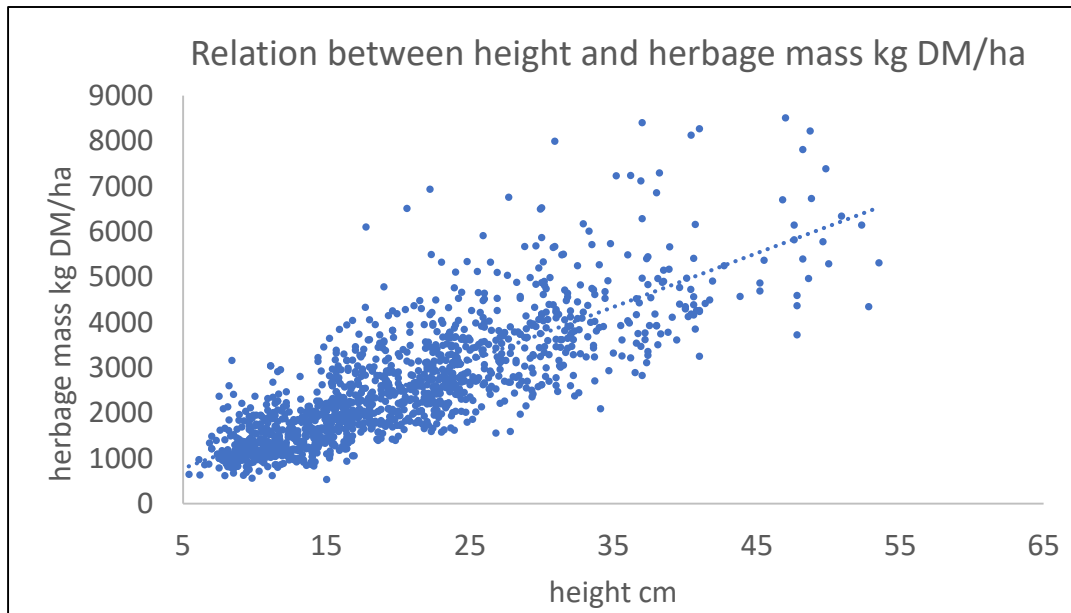
2951 ± 68.9 b

3002 ± 69.2 b

3135 ± 71.8 a

2924 ± 72.5 b

Differences were declared significant when P < 0.05 by Tukey HSD test

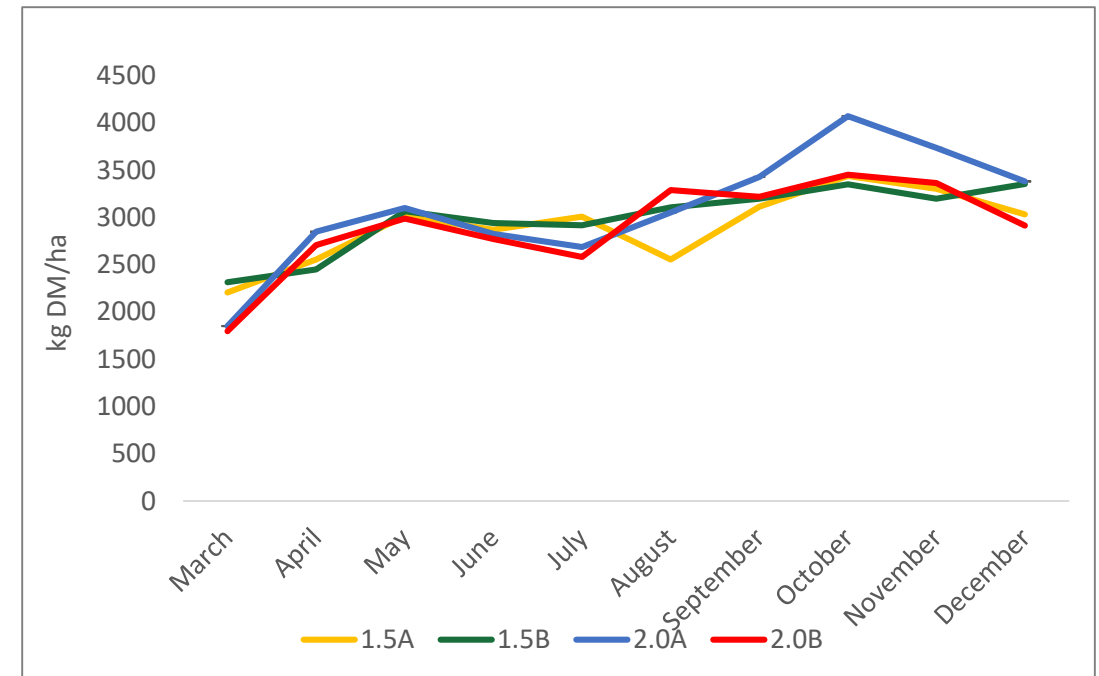


**n= 1927**

$$\beta_1 = 100.38$$

$$\beta_0 = 325$$

$$R^2 = 0.56$$



1.5A 1.5B 2.0A 2.0B



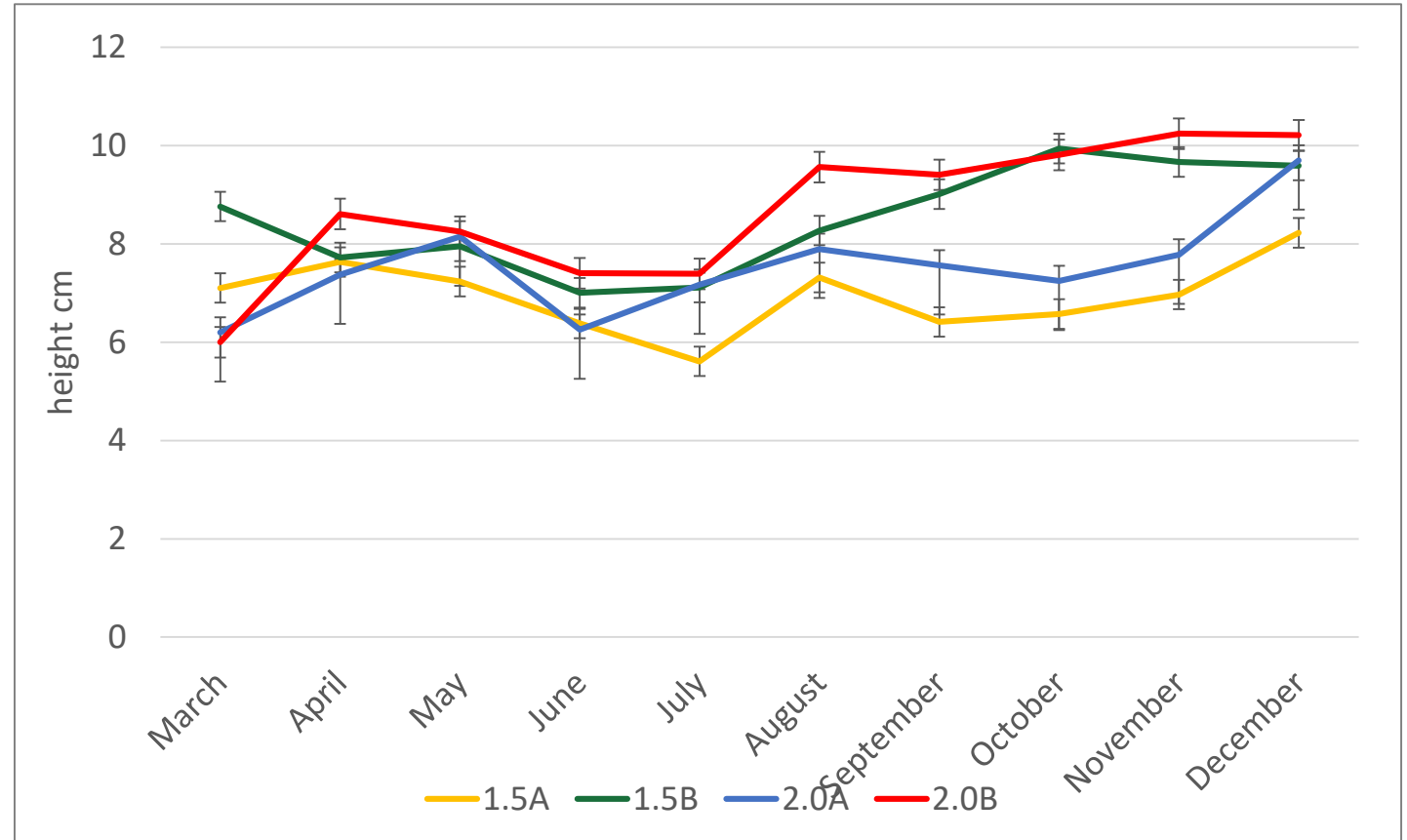


## Post-grazing height (cm) temporal distribution

### Post-grazing height (cm)

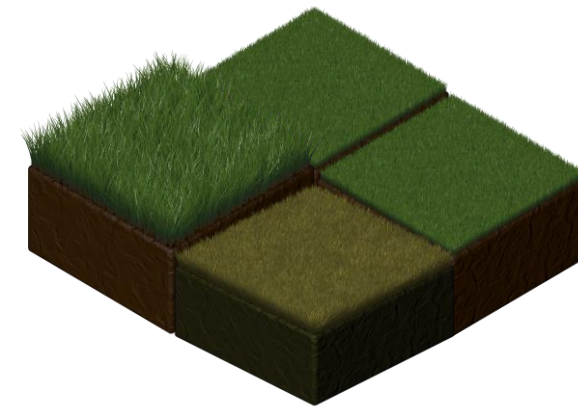
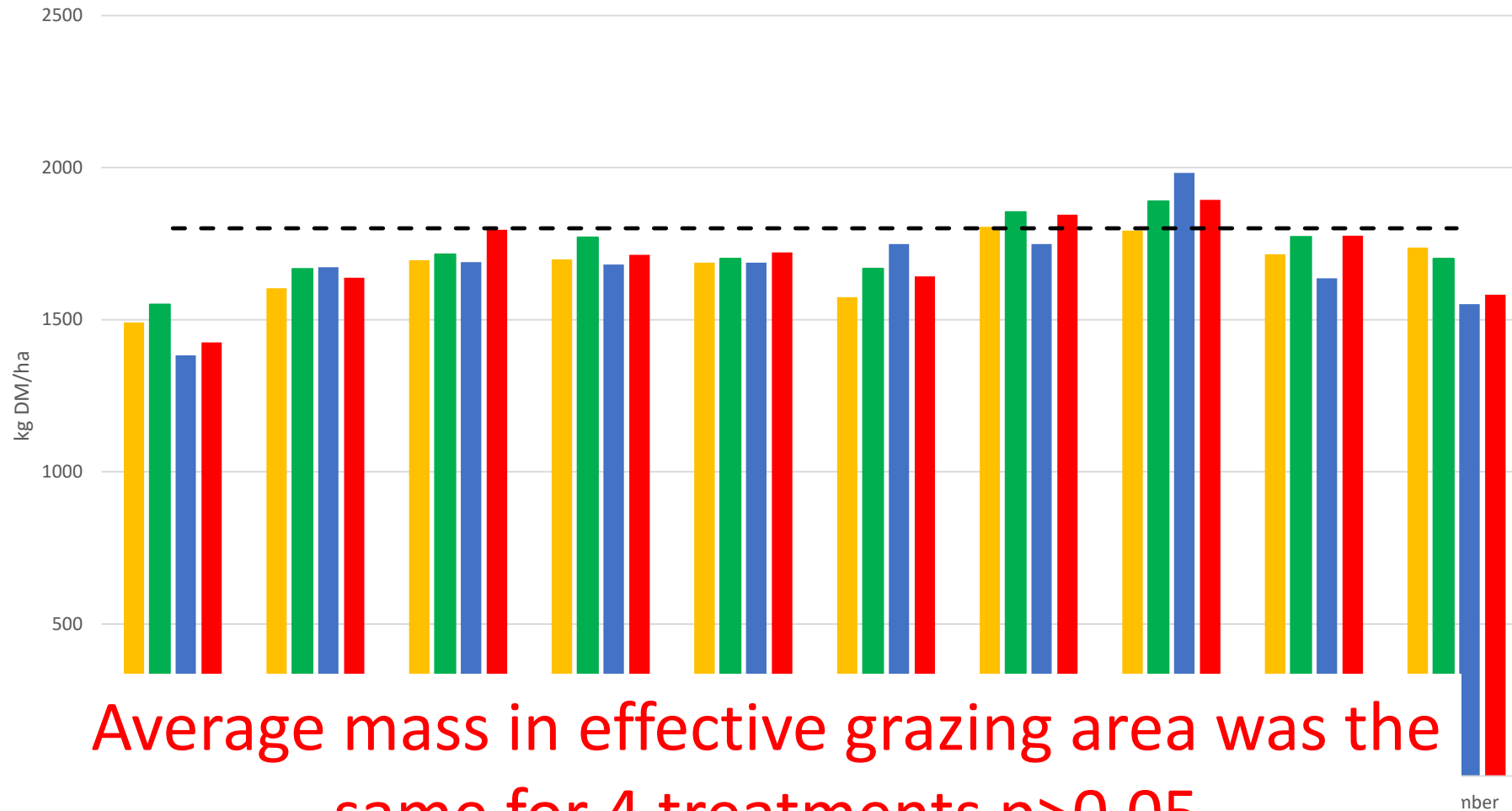
|              |        |
|--------------|--------|
| <b>1,5 A</b> | 7.23 c |
| <b>1,5 B</b> | 8.72 a |
| <b>2,0 A</b> | 7.66 b |
| <b>2,0 B</b> | 8.79 a |

Differences were declared significant when  $P < 0.05$  by Tukey HSD test





# Herbage mass on effective grazing area



Average mass in effective grazing area was the same for 4 treatments  $p > 0.05$

nber





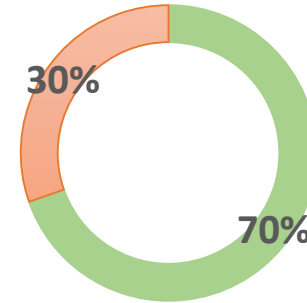
# Where was the differences?

- Direct and mechanic harvest
  - direct: 65% in 2.0 vs 48% in 1.5
  - 1.5 higher mechanic harvest
  - B pasture management - reserves

- Acces time to pasture

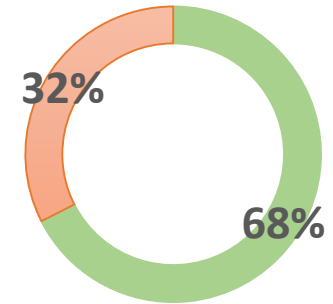


1,5 A



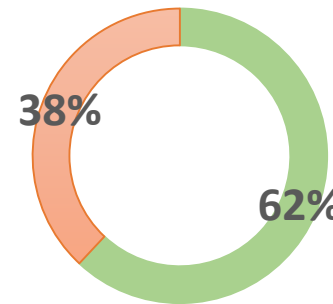
■ Grazing ■ Confinement

1,5 B



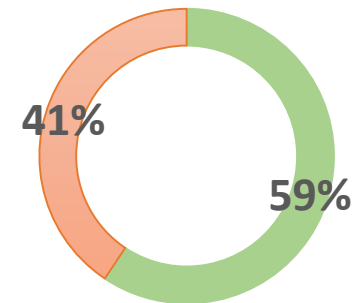
■ Grazing ■ Confinement

2,0 A



■ Grazing ■ Confinement

2,0 B



■ Grazing ■ Confinement



# Conclusions

- Residual sward height was lower at higher grazing intensity (A management), however, productivity was not affected by treatments, neither herbage mass and number of leaves at grazing (exception 2.0A).
- In order to intensify, increase stocking rate is recommended **as long as** exhaustive pasture monitoring is carried out
- Controlling grazing conditions is essential to keep dairy grazing systems sustainable on an intensification progress scenario





Thank you for your attention!



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