

# TMR versus grazing supplemented with TMR out or into the grazing plot: Productive response



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# Introduction

## Dairy Systems in Uruguay:

- Based on pasture and direct grazing
- Restriction pasture allowance is usually supplemented with corn silage and concentrates → offered separated and/or mixed (TMR)
- Cows could modify behavior in order to synchronize nutrients supply and improve performance, when feed sources of the diet are offered simultaneously in space and time (Villalba et al, 2015)



# Hypothesis

- ü Allocation of TMR simultaneously in the grazing plot will perform better than when it is offered separated from pasture in space and time

## Objectives

To study the effect of three contrasting feeding strategies involving TMR and grazing, during the first 60 days in milk of Holstein dairy cows on:

- ü productive performance
- ü changes in grazing pattern and cow behavior

# Materials and methods

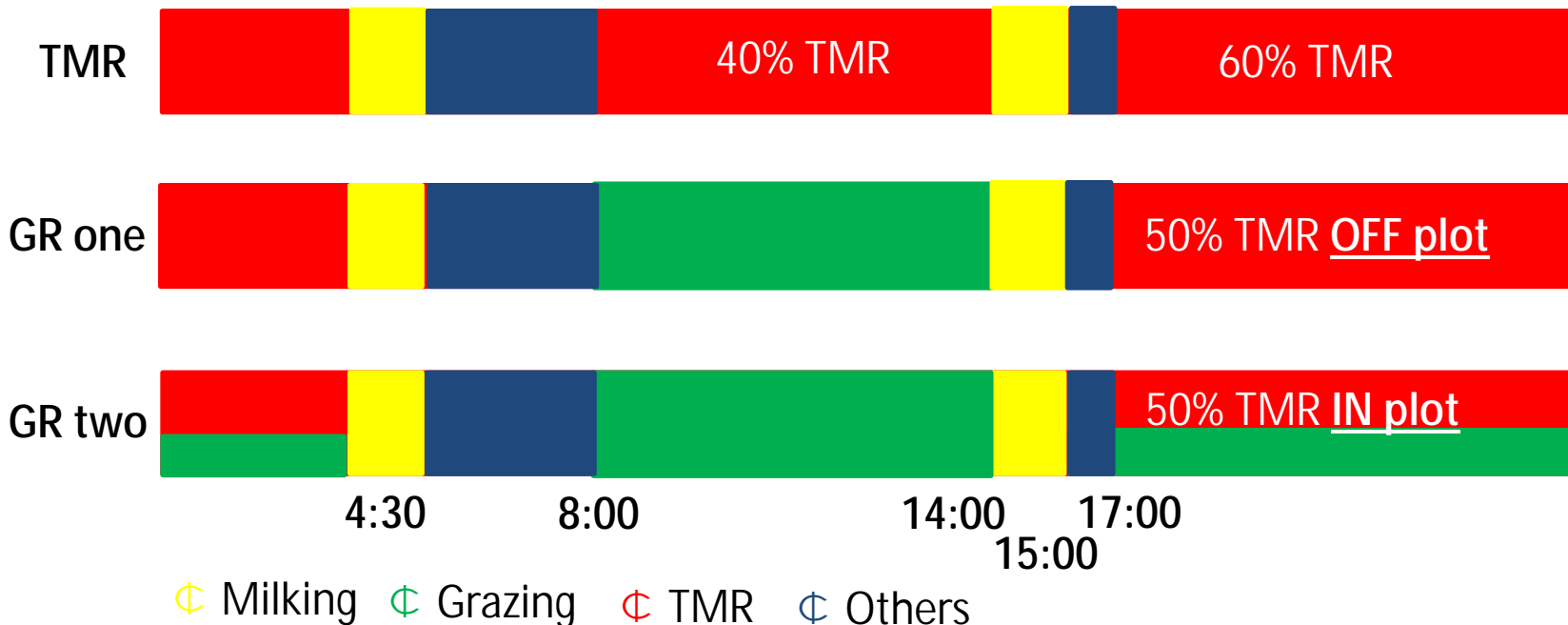
ü Thirty-six autumn-calving Holstein cows

- $640 \pm 49.2$  kg LW
- $2.9 \pm 0.37$  BCS



ü Randomized in a block design of 3 treatments:

GR one = one grazing session (AM 08:00 to 11:00 h) at 17% TMR  
 GR two = two grazing sessions (AM 08:00 to 11:00 h) at 17% TMR  
 TMR = 40% TMR (AM 08:00 to 11:00 h) at 17% TMR



# Materials and methods

- ü Fescue based pasture (2<sup>nd</sup> year)
  - Mean herbage mass  $3300 \pm 758$  kg DM/ha. (over 4 cm)
  - Grazing daily strips; 40 kg DM/cow/d (at 1.7 km)
- ü Herbage mass was measure weekly (double sample technique adapted with rising plate meter)
- ü Milk yield was registered daily (0430 and 1500 h) and milk composition weekly
- ü Cow BCS was recorded weekly (1-5 scale; Edmonson et al. 1989)
- ü Cow behavior was visually recorded (Chilibroste et al., 2012)
  - At days 10, 13, 30 and 33 of lactation
  - During the first 4 h (AM) and 3 h (PM) of the grazing sessions
  - Grazing, eating in feeders and idling every 15 min

# Statistical analysis

- ü Data were analyzed in a mixed model

- ü GLIMMIX PROCEDURE (SAS, 2010)

- ü Productive responses:

- ü Model included treatments, week and their interaction as fixed effects and block as a random

- ü Behavior variables:

- ü To determine the probability of the different events a binomial response distribution and with Logit as a link function was used

- ü Model included treatments, hour and their interaction as fixed effects

# Chemical composition of TMR and pasture

	TMR	Pasture
Dry matter (DM, %)	40.6 ± 0.28	19.9 ± 3.30
Crude protein (CP, %)	14.6 ± 1.36	12.7 ± 1.75
Neutral detergent fiber (%)	39.9 ± 2.15	62.1 ± 2.65
Acid detergent fiber (%)	19.5 ± 2.23	34.5 ± 2.40

# Results



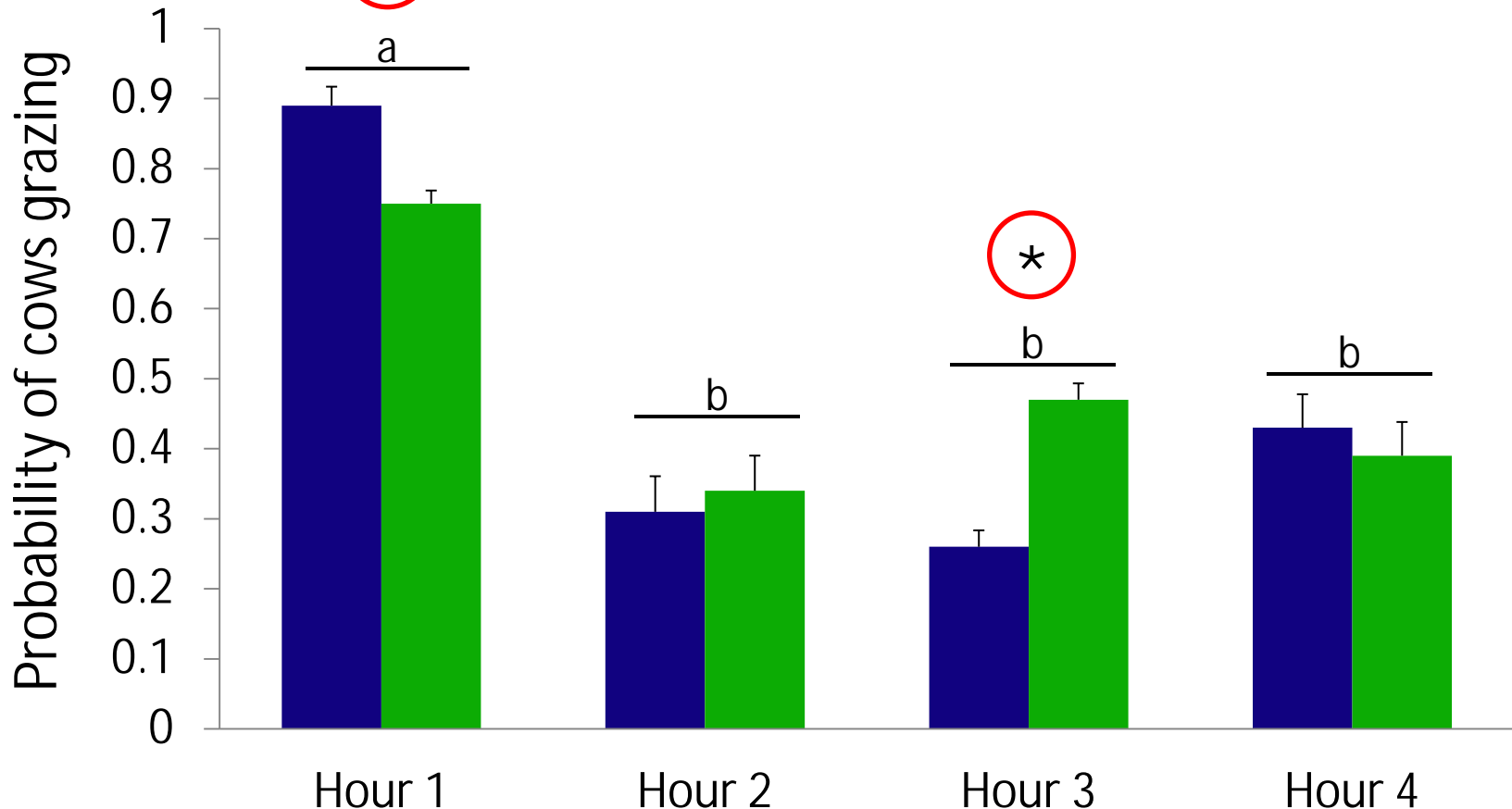
# Effect of feeding strategy on milk yield, milk composition and BCS of dairy cows

	Treatments (T)			SEM	P-value		
	TMR	GR-one	GR-two		T	W	TxW
Milk yield (kg/d)	35.9 <sup>a</sup>	30.8 <sup>b</sup>	29.7 <sup>b</sup>	0.816	<0.01	<0.01	<0.01
Fat (%)	3.25 <sup>b</sup>	3.67 <sup>ab</sup>	3.72 <sup>a</sup>	0.175	<0.05	<0.05	NS
Protein (%)	3.24	3.40	3.35	0.079	NS	<0.01	NS
Lactose (%)	4.80	4.75	4.78	0.041	NS	<0.01	<0.01
NEI output (Mcal/d)	25.7 <sup>a</sup>	21.8 <sup>b</sup>	22.0 <sup>b</sup>	1.20	<0.01	NS	NS
Cow BCS	3.09 <sup>x</sup>	2.91 <sup>x</sup>	2.75 <sup>y</sup>	0.145	<0.07	NS	NS

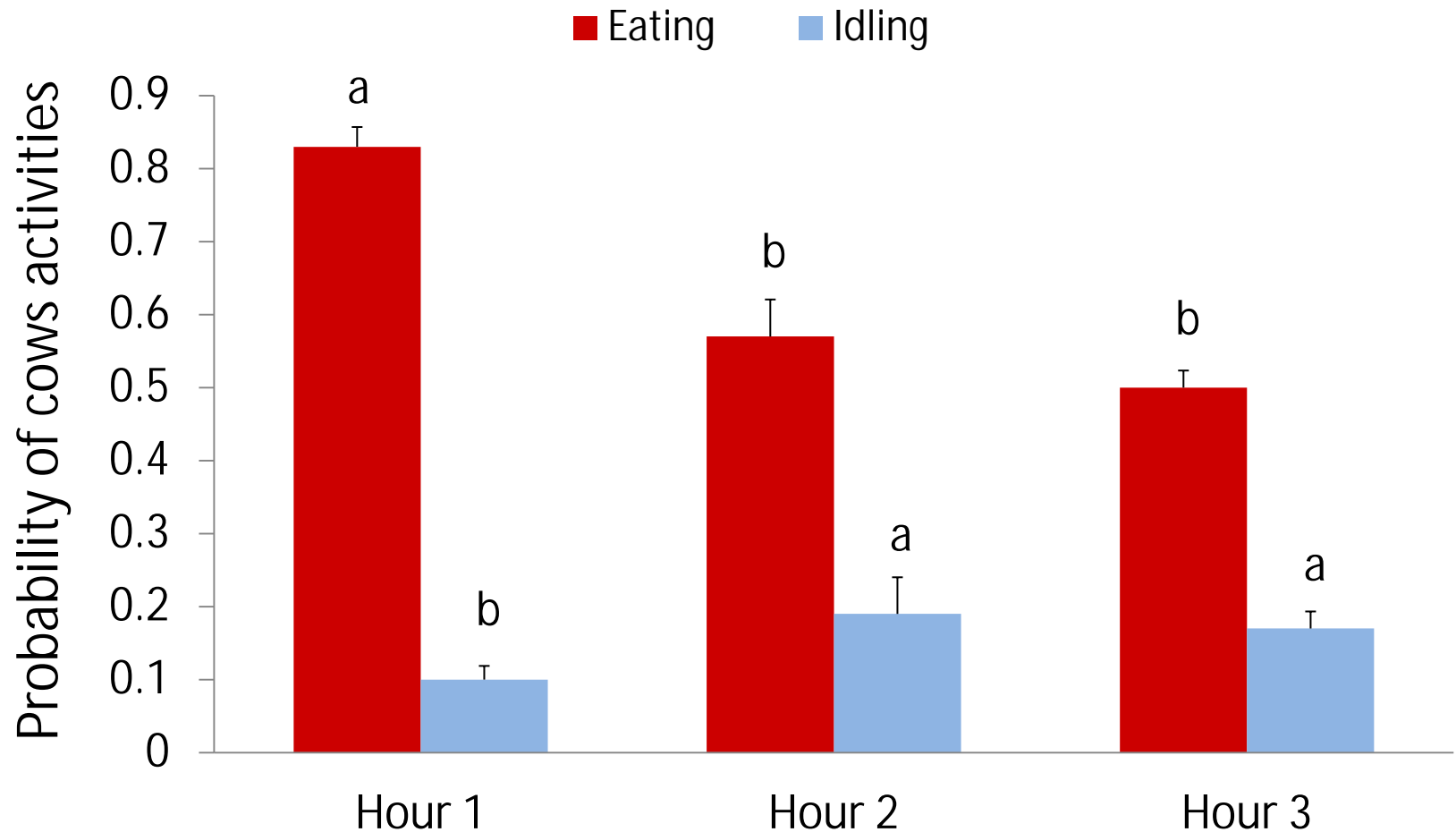
Could cow behavior partially explain  
this results?

# Probability of cows grazing during the first 4 h of the AM session: GR-one and GR-two

ü The probability of cows grazing was affected ( $P < 0.05$ ) by the hour and the interaction between treatment and hour



# Cow behavior during the first 3 h of the PM session: GR-two cows



# In summary

- ü TMR cows produce more milk and milk energy output
- ü Despite GR-two had better opportunity to synchronize nutrients supply, productive performance was not expressed
- ü The behavior of GR-two in the PM grazing session, suggested that cows did not exploit the advantage of a longer time of access to pasture (when compared with GR-one) and spent a lot of time around feeders
- ü Other factors can explain these results, pasture conditions and management, walk distance, cow training...



**THANK YOU!!**

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