

Multispecies swards and animal performance

Prof. Tommy Boland

School of Agriculture and Food Science, University College Dublin, Belfield, Dublin 4.

Tommy.boland@ucd.ie



@Pallastb @SMARTSWARD1

Dr. Helen Sheridan, Dr. Cornelia Grace, Assoc. Prof. Bridget Lynch, Dr. Alan Kelly, Prof. Frank Monahan, Prof. Olaf Schmidt, Dr. Paul Murphy, Assoc. Prof. Karina Pierce, Assoc. Prof. Finbar Mulligan, Dr. Jean Kennedy, Dr. Philip Creighton, Gaspard Beaucarne, Fionnuala Godwin, Jonathan Higgins, Lisa McGrane, Michelle Kearns, Kate McCarthy, Shona Baker and many others



- 
- Multispecies sward is a broad term to describe swards containing a range of different plant species
 - Also referred to as herbal leys
 - Not to be confused with species rich grasslands
 - Or Legume/Herb swards in New Zealand
 - They are dynamic within and between years

Impact of MSS on animal performance

- Focus on Irish data
- Focus on animal performance (growth and yield)
- Environmental impacts (nitrogen and methane) work is planned and underway but awaiting results



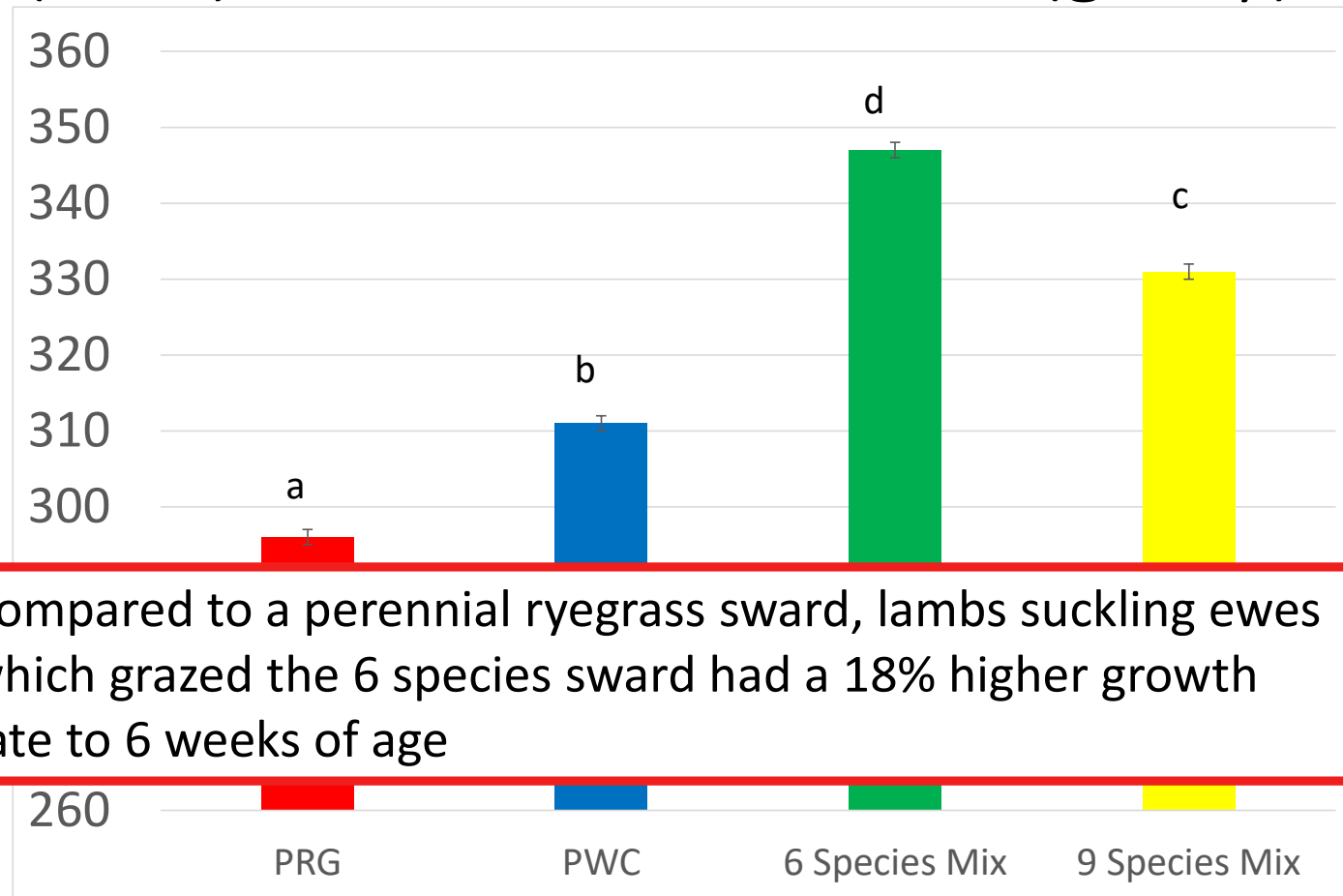
Sheep only

4 sward types, randomised and replicated – 2015 & 2016

- PRG @ 163 kg N/ha/yr
- PRG & WC @ 90 kg N/ha/yr
- 6 species (2 x grasses + 2 x legumes + 2 x herbs) @90 kg N/ha/yr
- 9 species (3 x grasses + 3 x legumes + 3 x herbs) @90 kg N/ha/yr
- Stocked at 12.5 ewes per ha
- Each ewe was rearing twin lambs

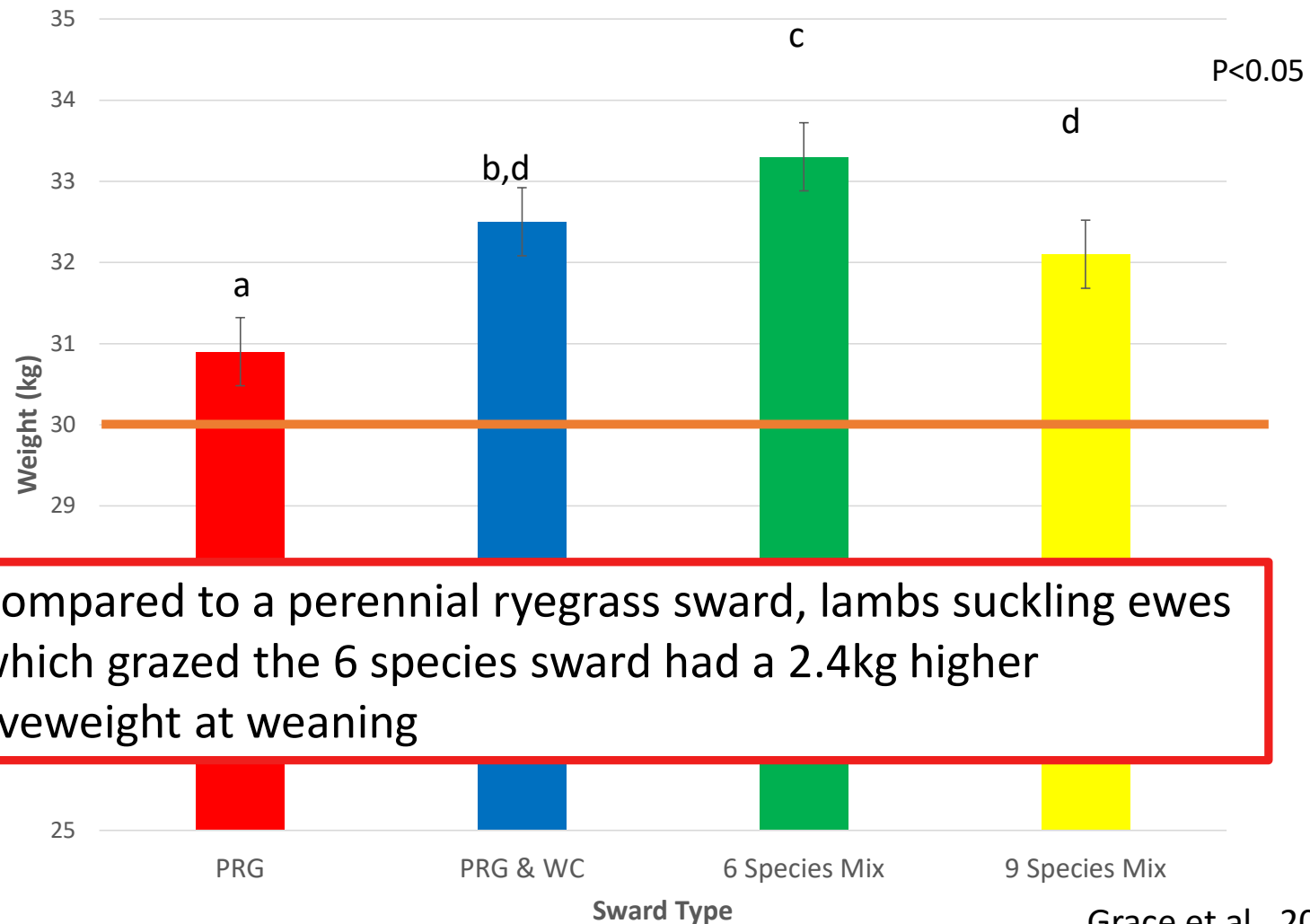
The effect of sward type on average daily gain (ADG) from birth to 6 weeks(g/day)

P<0.05

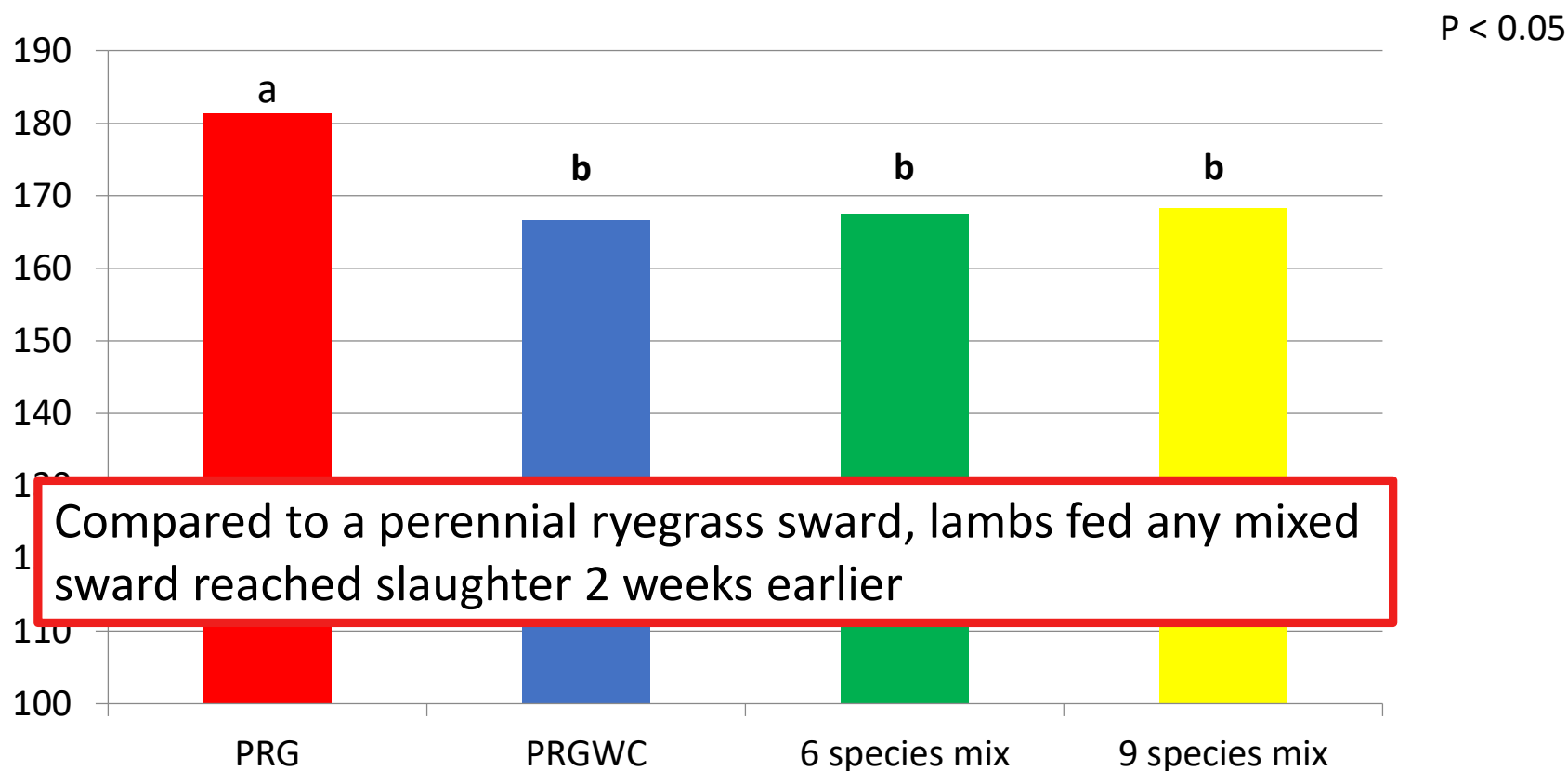


Compared to a perennial ryegrass sward, lambs suckling ewes which grazed the 6 species sward had a 18% higher growth rate to 6 weeks of age

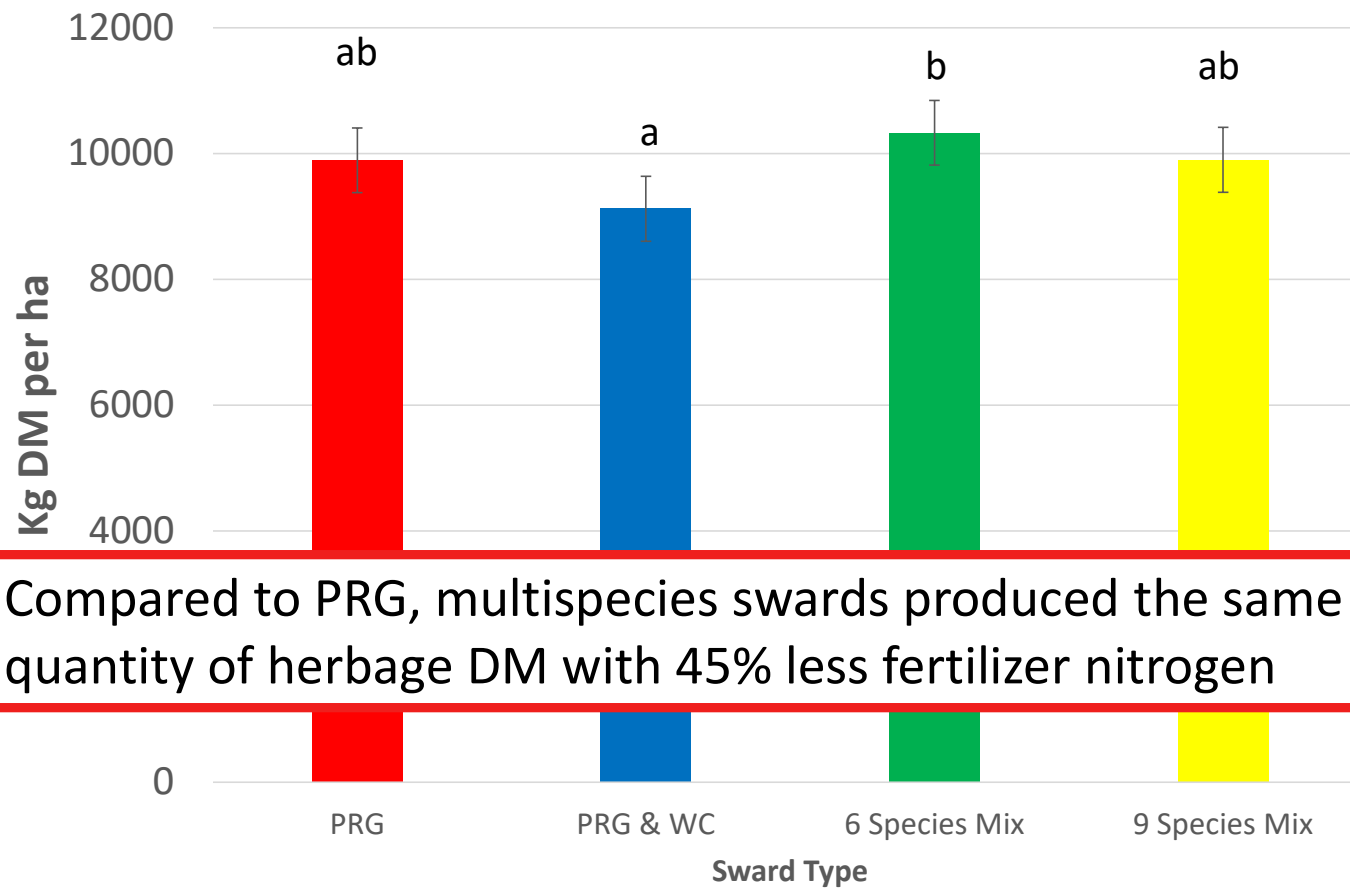
The effect of sward type on lamb weaning weights



The effect of sward type on number of days required to reach target slaughter weight

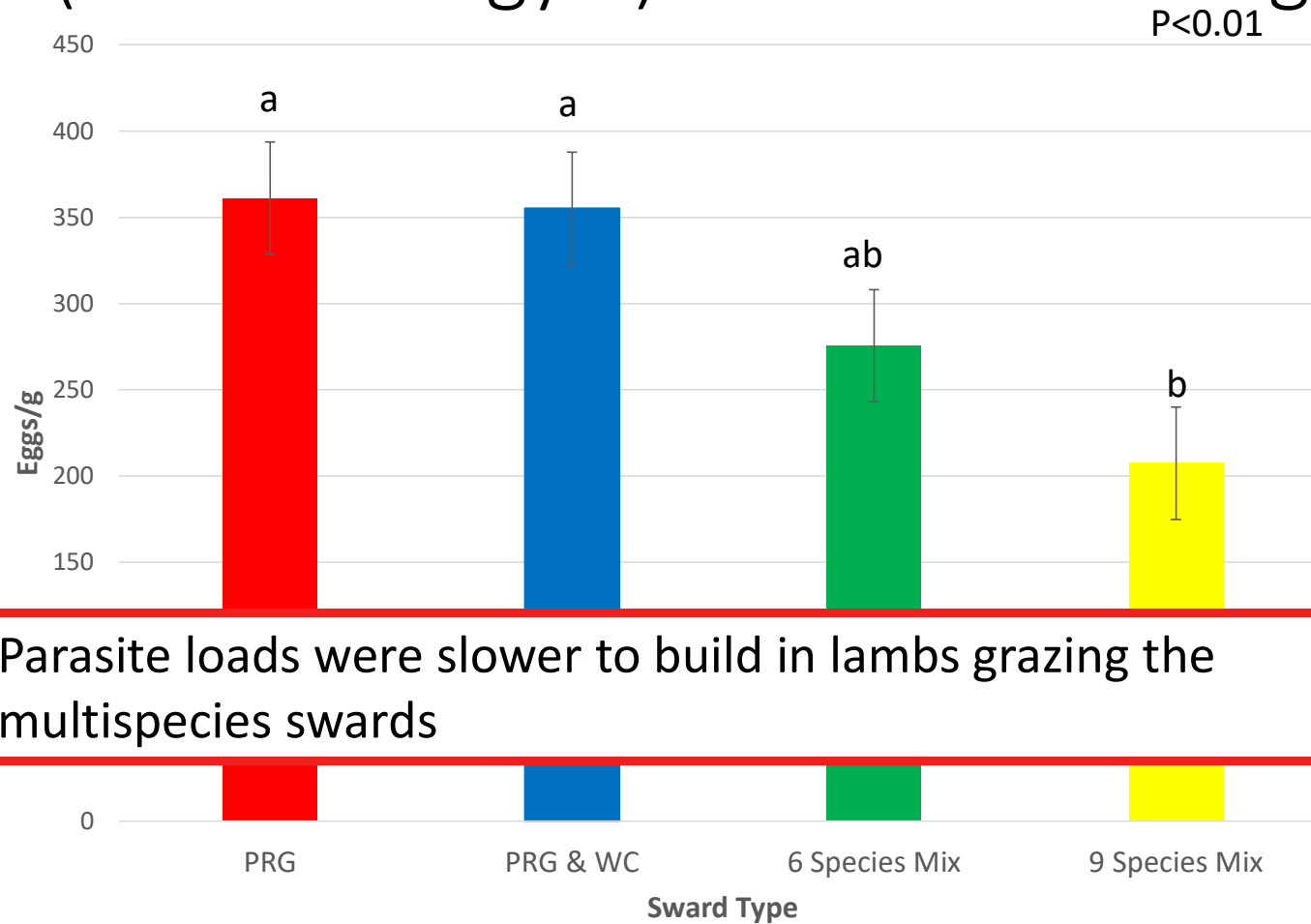


The effect of sward type on annual herbage DM production

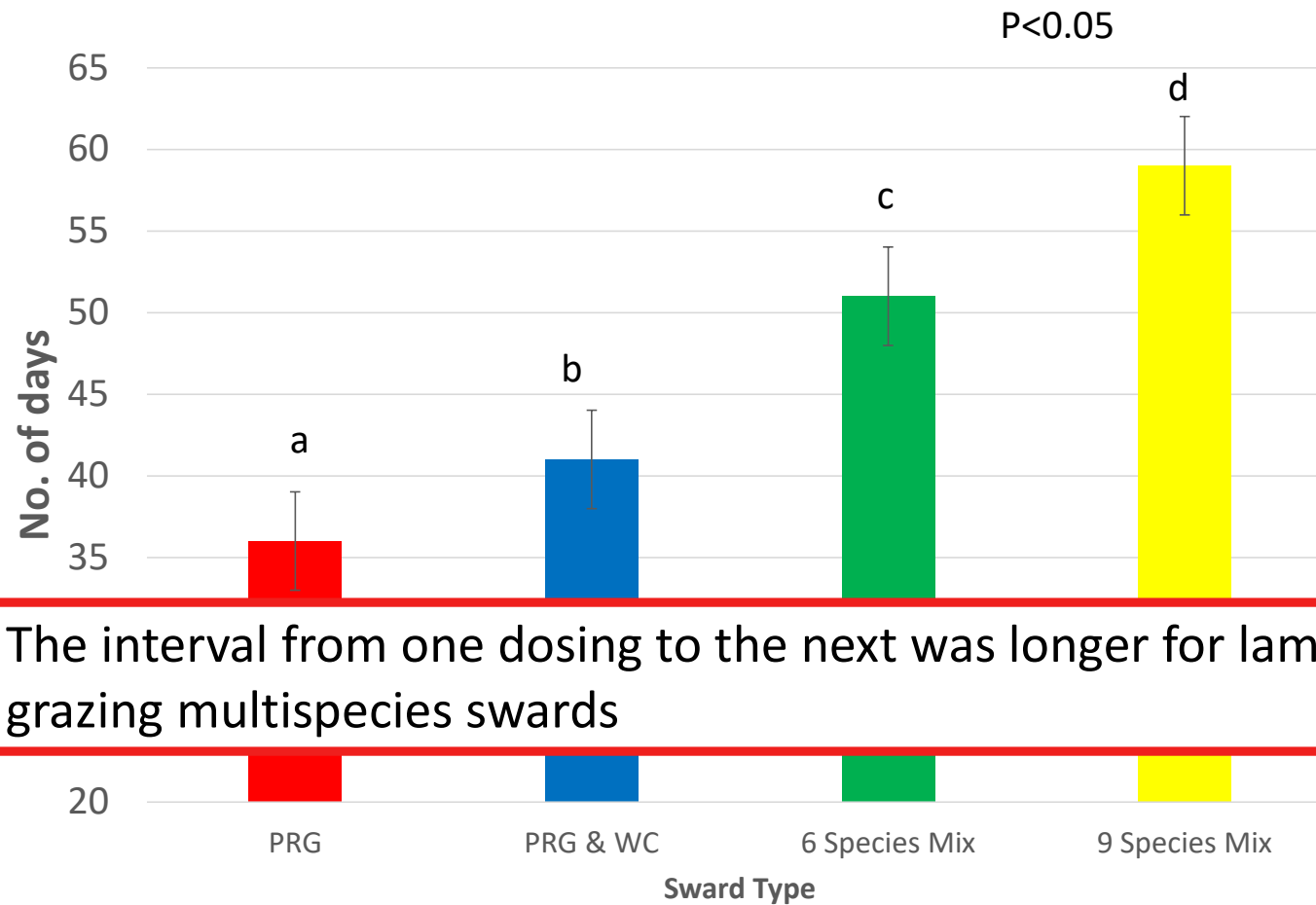


Compared to PRG, multispecies swards produced the same quantity of herbage DM with 45% less fertilizer nitrogen

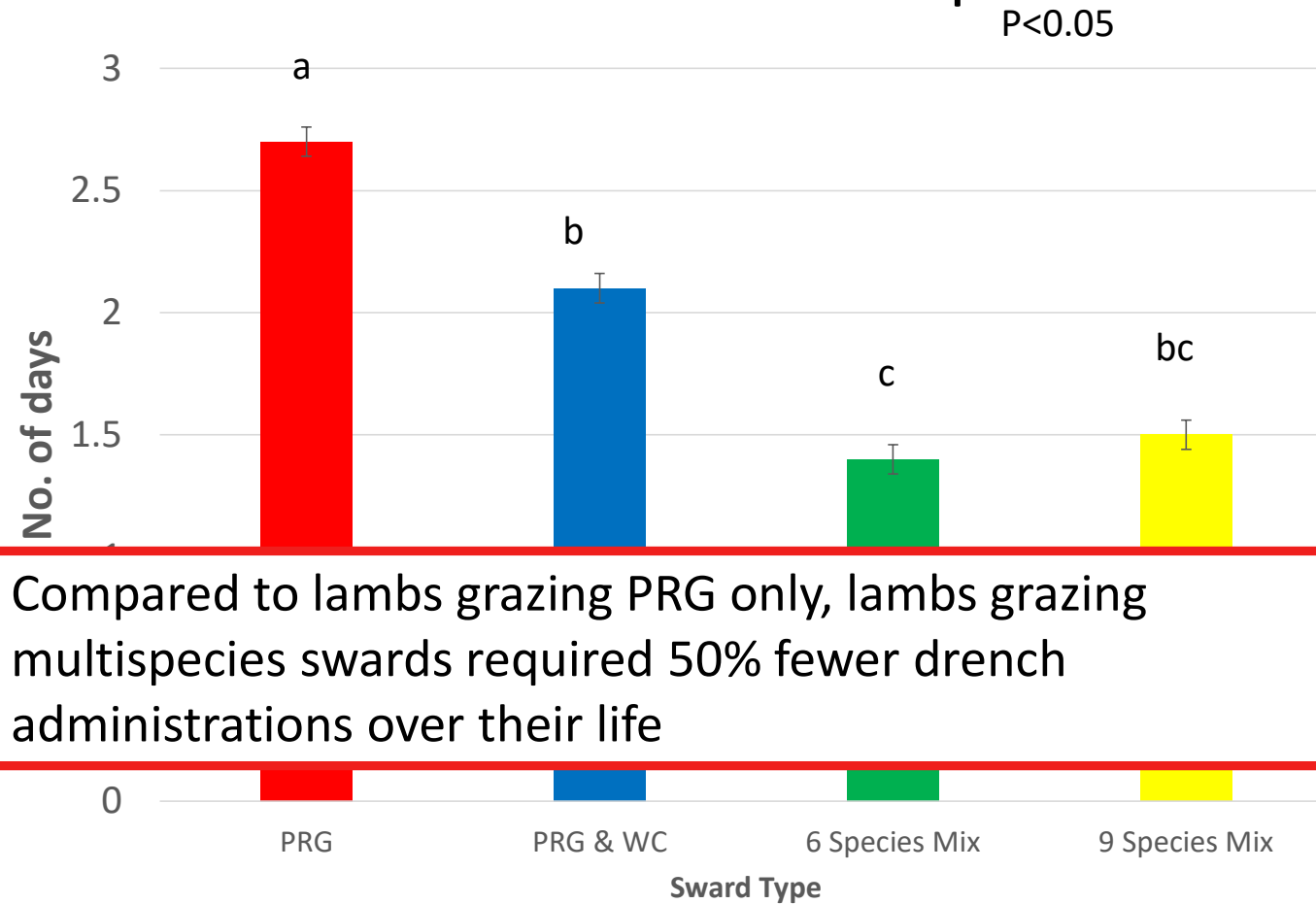
The effect of sward type on faecal egg counts (Trichostrongyle) at 10 weeks of age



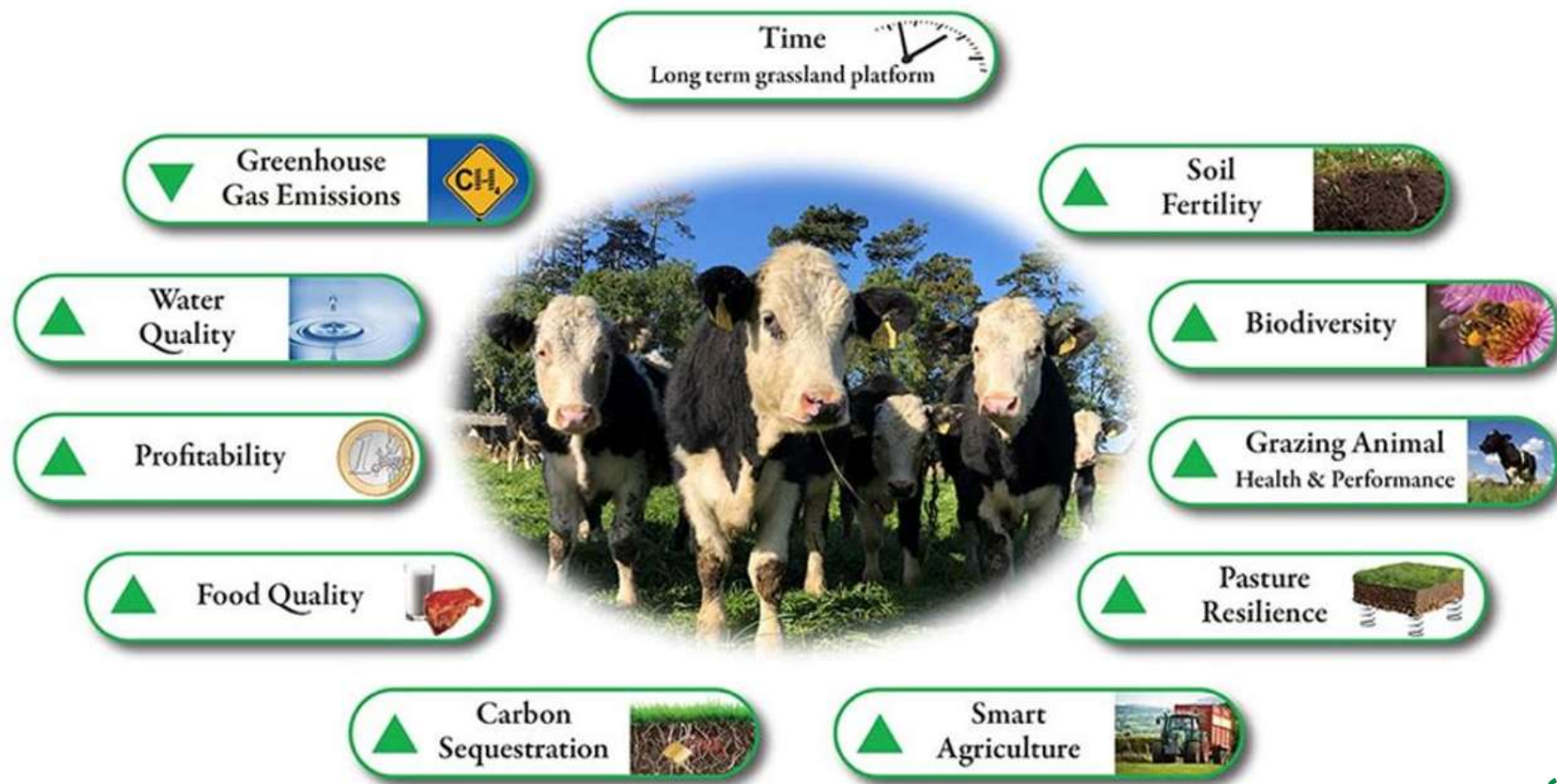
The effect of swards type on the time-lag between first and second anthelmintic treatment



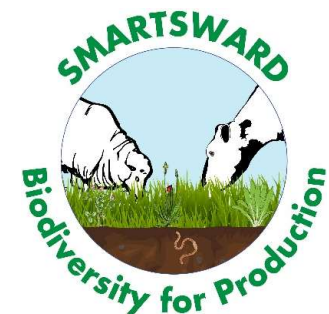
The effect of swards type on mean number of anthelmintic treatments required



Grace et al., 2019

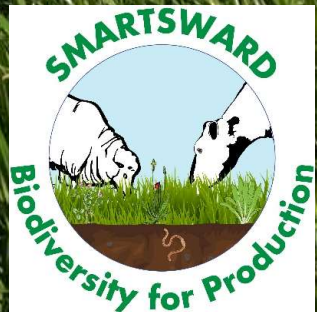


 @SMARTSWARD1

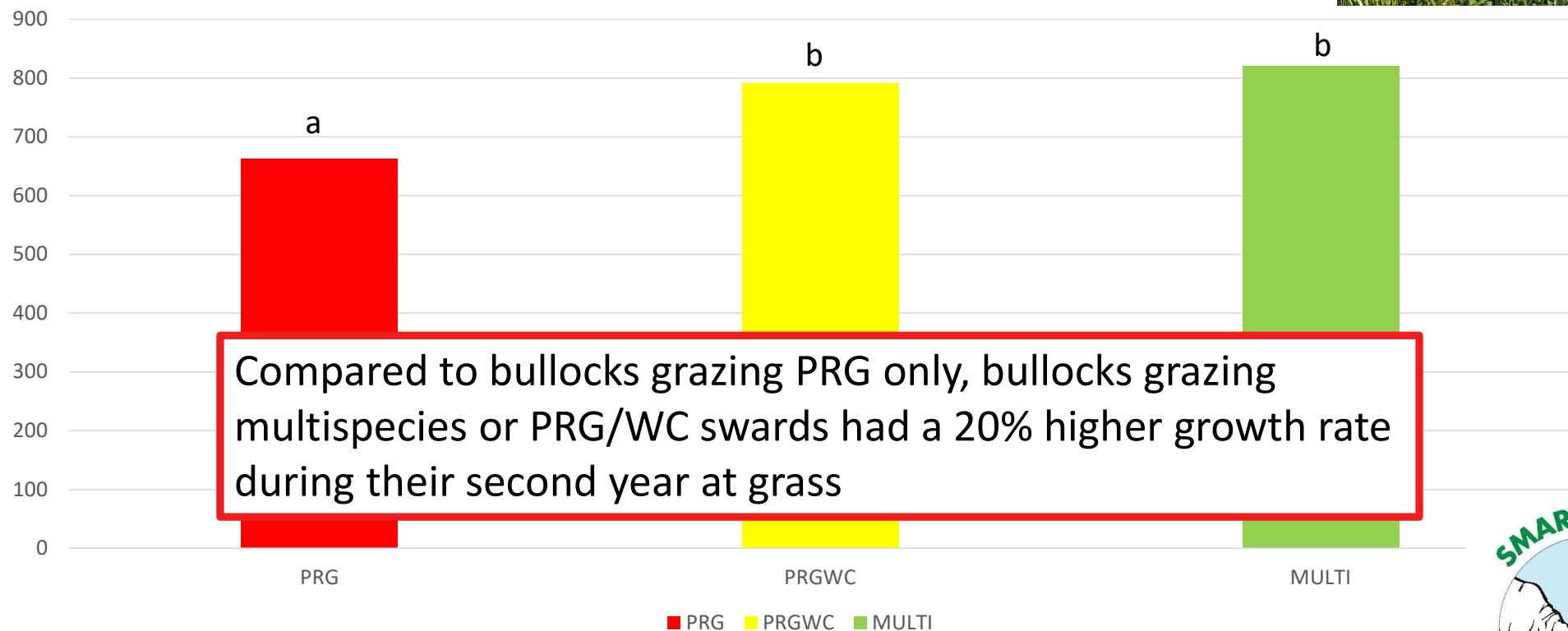


Cattle only

- Three experimental farmlets (8 ha per farmlet) stocked at 2.5 LU/ha
- PRG
- PRG and white clover
- MULTI: PRG, Timothy, white clover, red clover, ribwort plantain and chicory
- Target available pre-grazing herbage mass is 1200-1800 kg DM/ha. Target post grazing height is 4 cm for PRG, PRGWC and 6 cm for the MULTI sward.

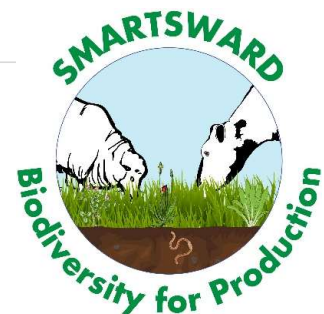


The impact of sward type on average daily gain of beef steers during their second year at pasture



Godwin et al., 2021

$P < 0.05$



Cattle and sheep co-grazing



Table 1: Sward type species composition and grazing targets

	PRG	PP	6 SP	12 SP
Sown species composition	PRG	none	PRG Timothy W. clover R. clover Chicory Plantain	PRG Timothy Cocksfoot W. clover R. clover Birdsfoot trefoil Sainfoin Chicory Plantain Yarrow Salad Burnet Sheep parsley
Pre grazing cover	1500 kg DM ha ⁻¹	1500 kg DM ha ⁻¹	2500 kg DM ha ⁻¹	2500 kg DM ha ⁻¹
Post grazing height	4 cm	4 cm	6 cm	6 cm
Number of days per rotation	21 days	21 days	28+ days	28+ days
Fertiliser rate	170 kg N ha ⁻¹ year ⁻¹	135 kg N ha ⁻¹ year ⁻¹	70 kg N ha ⁻¹ year ⁻¹	70 kg N ha ⁻¹ year ⁻¹

• Experimental set up:

- 4 sward types
- 9 ha each in 8 divisions
- Rotational grazing
- Over 2 years
- 80 heifers (AAx & HEx, 1 yr)
- 88 ewes (suffolk cross)
- 136 lambs
- Leader follower system

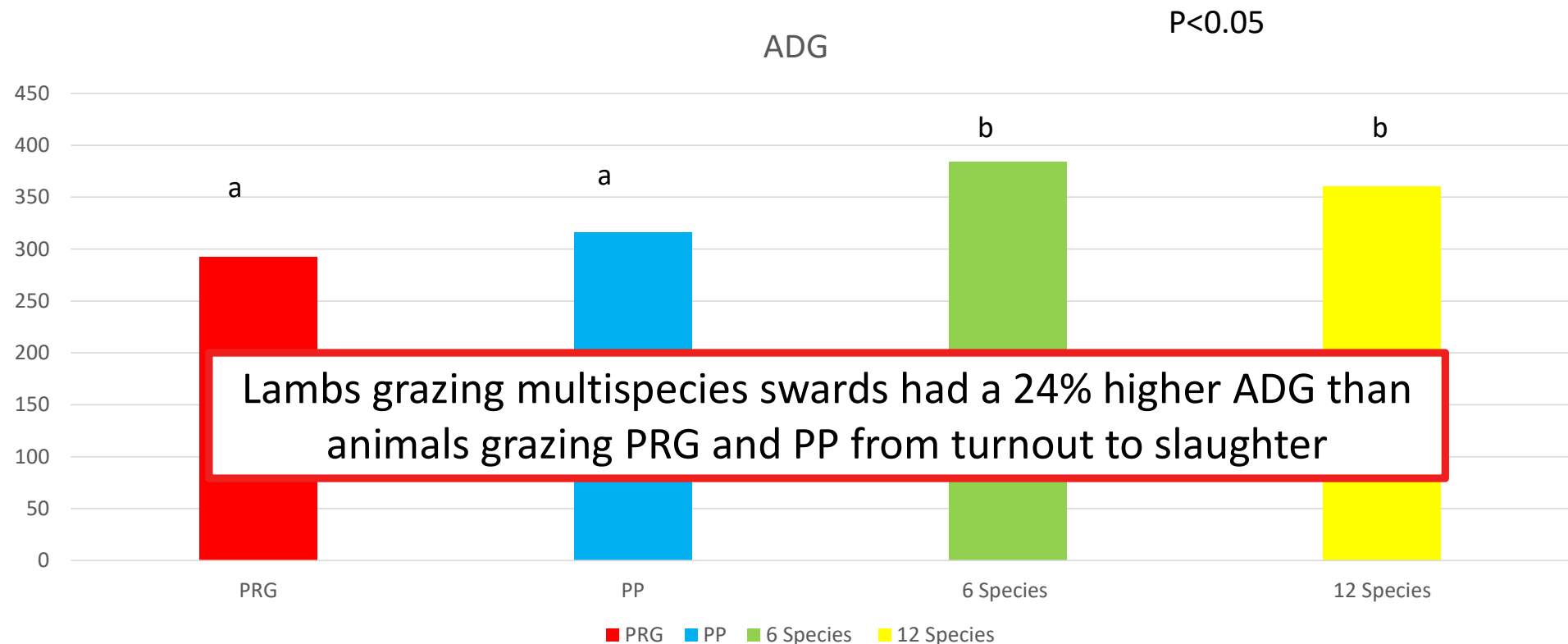


Beaucarne et al. 2020

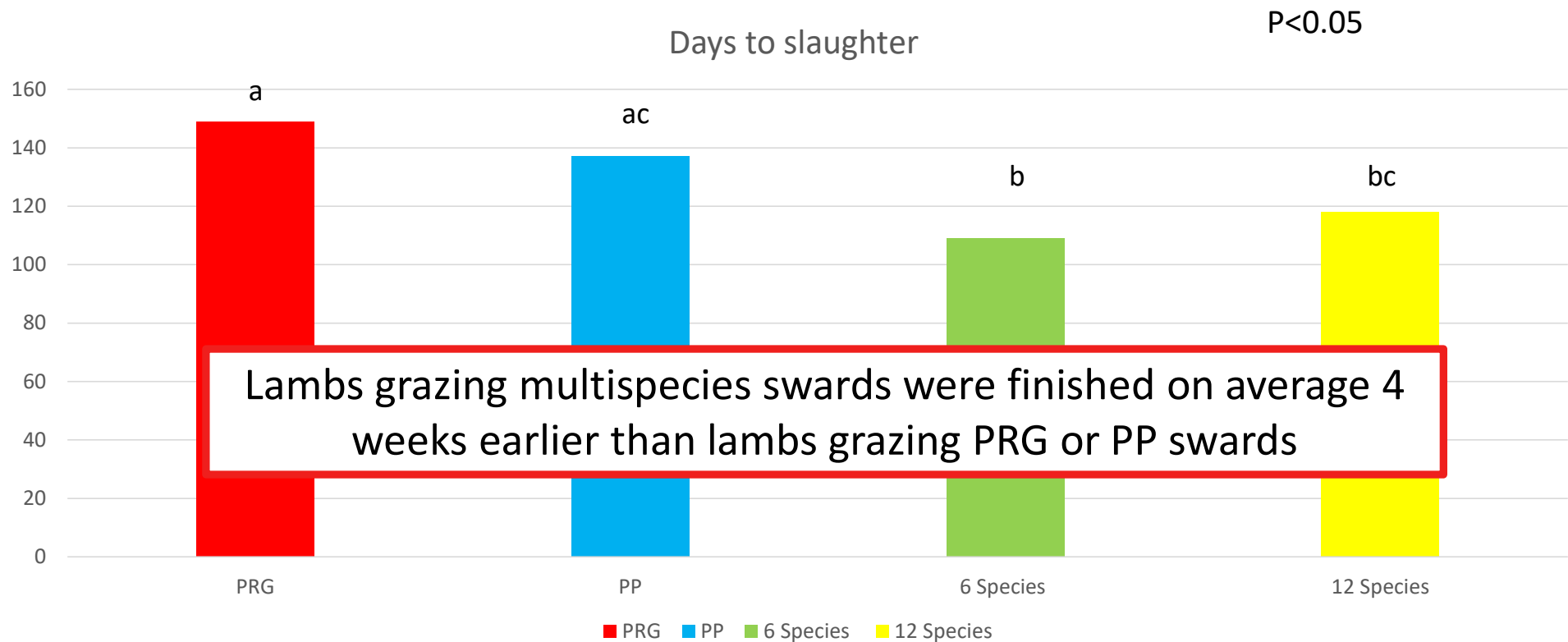
DEVENISH™
Beyond Nutrition

HEARTLAND
ONE HEALTH FROM SOIL TO SOCIETY

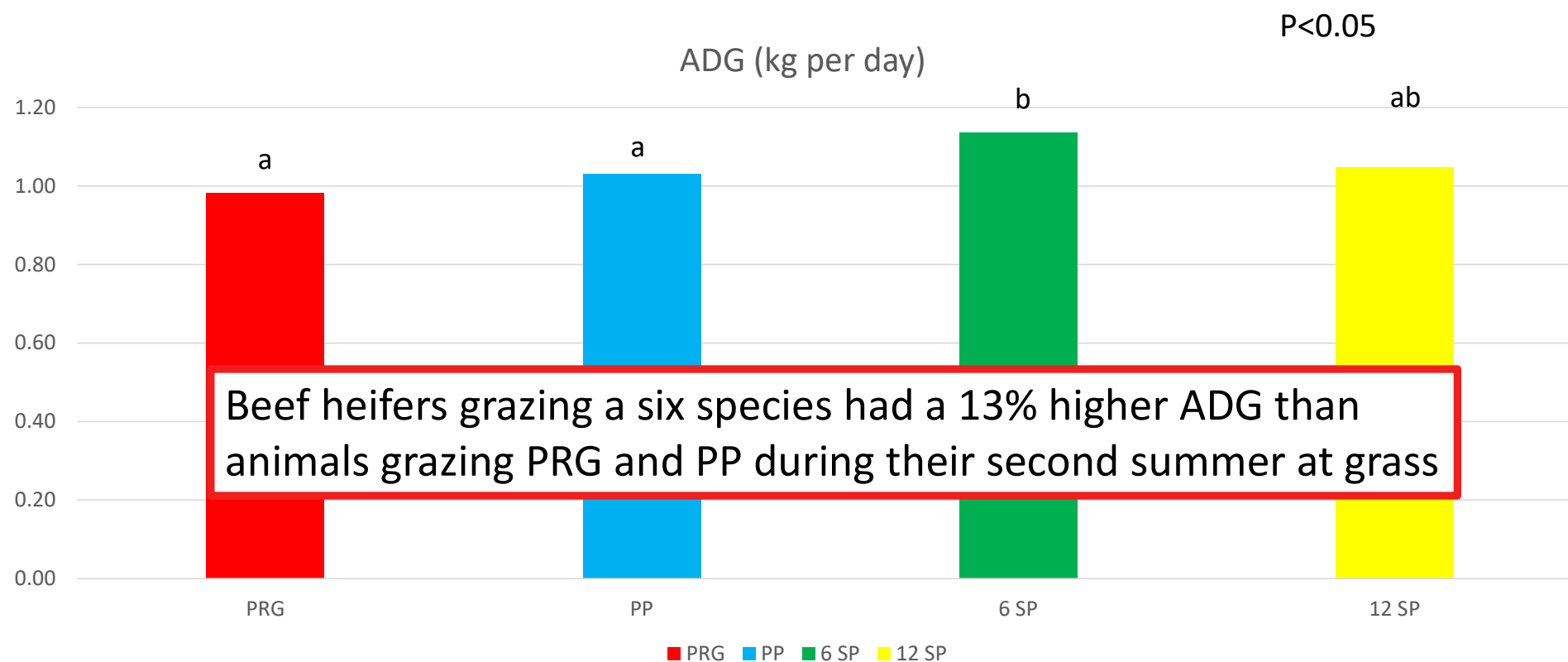
The impact of sward type on lamb average daily gain from birth to slaughter



The impact of sward type on lamb age at slaughter



The effect of sward type on heifer ADG from turnout to slaughter



Zero-grazed dairy cows

Perennial ryegrass
250kg N

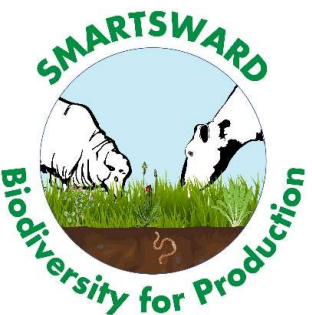
- Aberchoice (D)
- Abergain (T)

PRG and White clover
90kg N

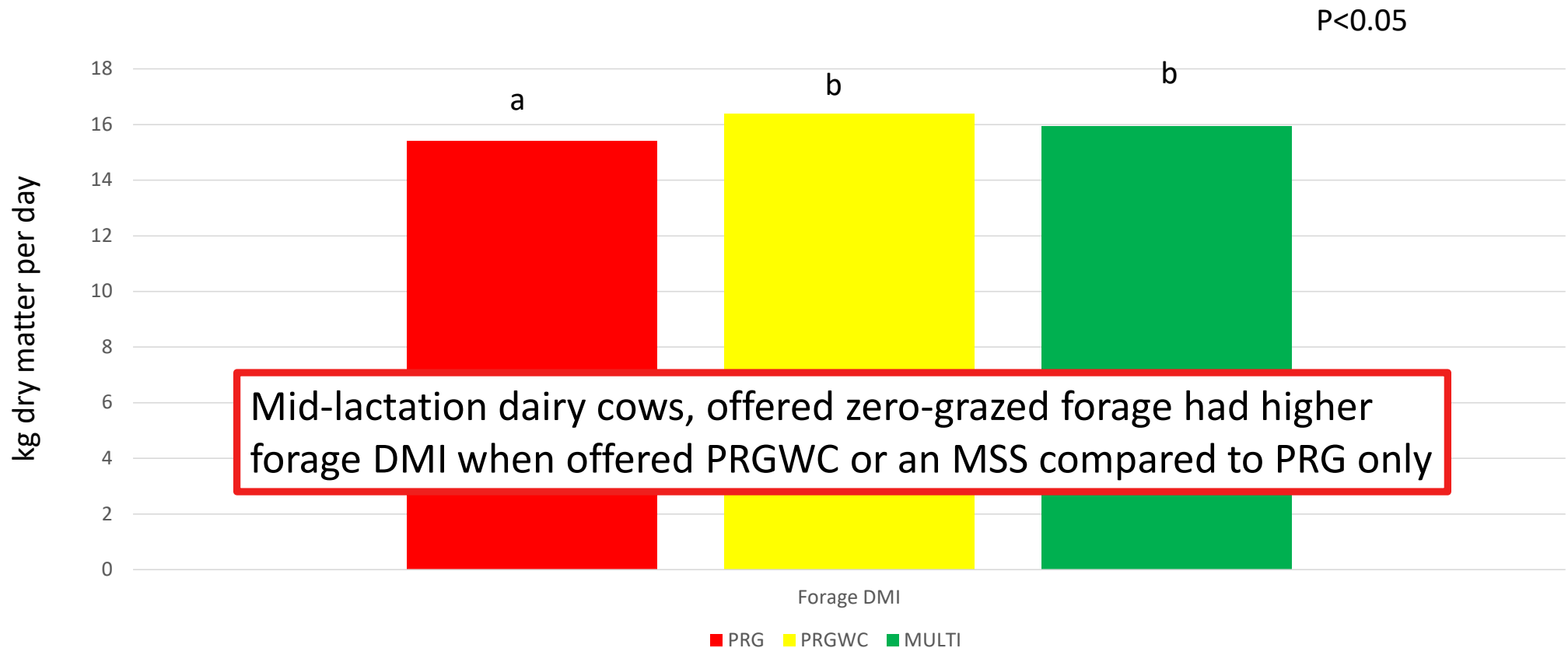
- Buddy (medium)
- Iona (medium)

Multispecies sward
90kg N

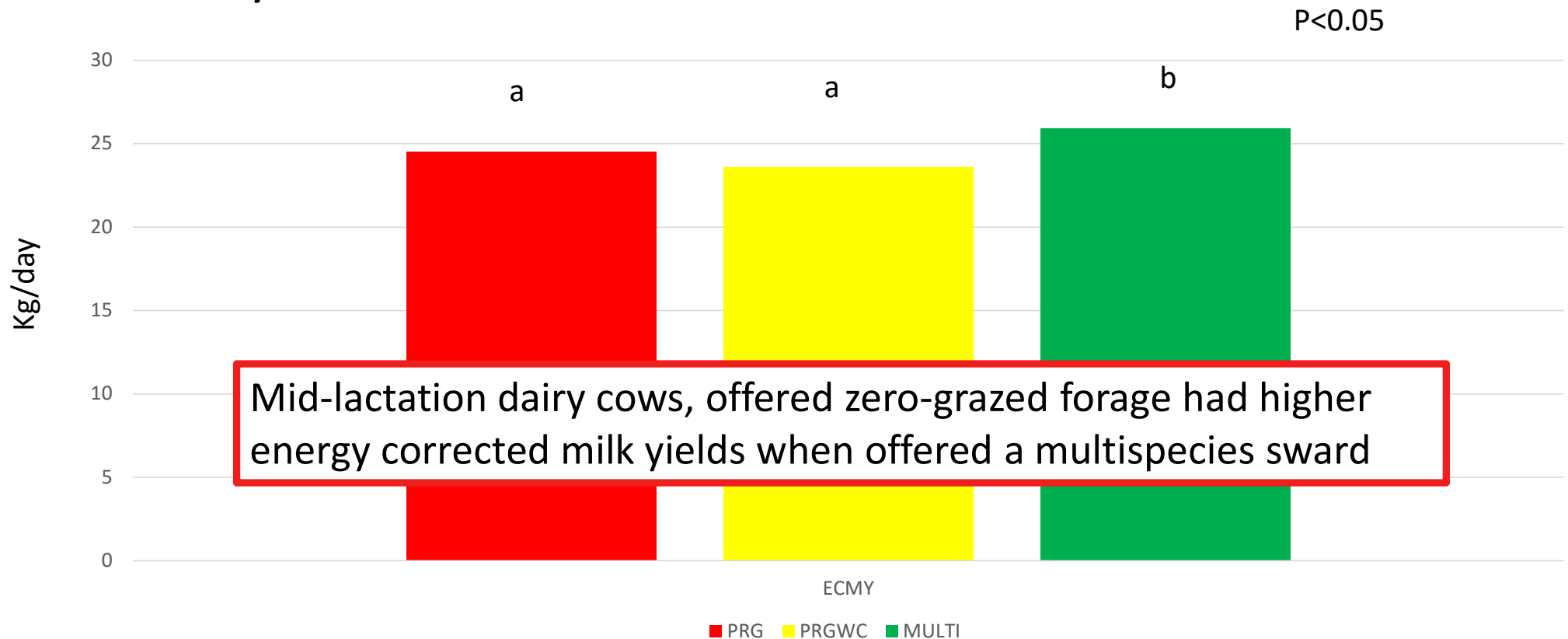
- Perennial ryegrass
- Timothy – Presto, Erecta, Alma
- White clover
- Red clover – Aberchianti, Milvus
- Chicory – Puna and Choice
- Plantain – Ecotain and Agritonic



The effect of sward type on forage dry matter intake

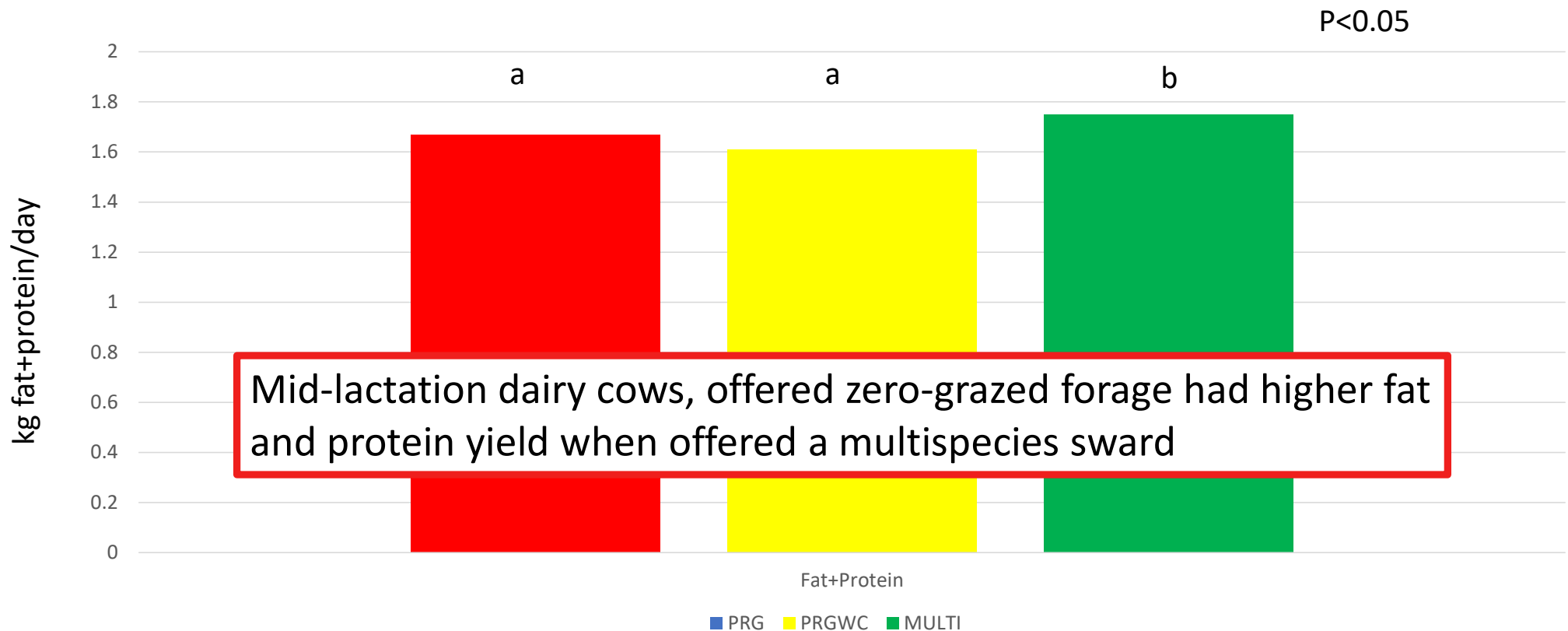


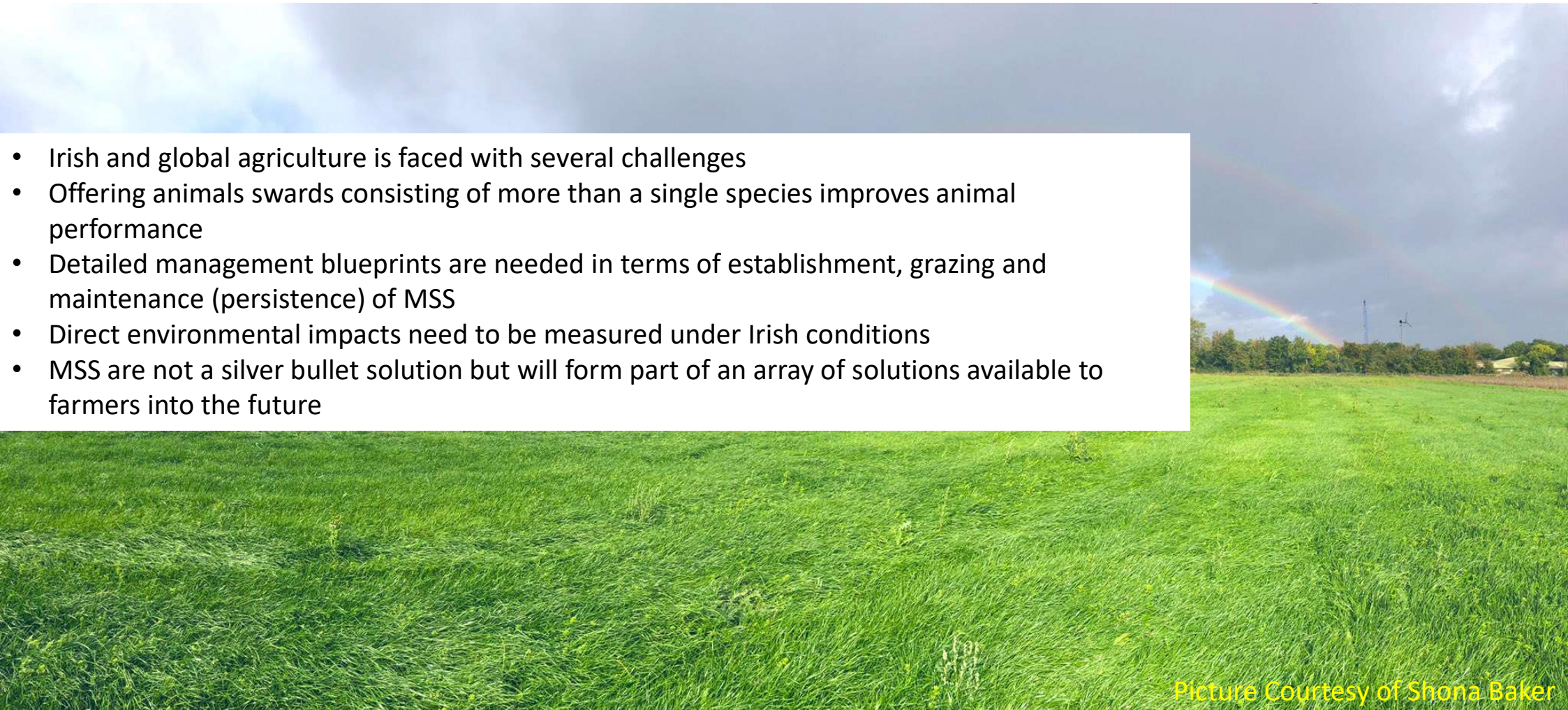
The effect of sward type on energy corrected milk yield



McCarthy et al., 2021

The effect of sward type on forage dry matter intake





Picture Courtesy of Shona Baker

- Irish and global agriculture is faced with several challenges
- Offering animals swards consisting of more than a single species improves animal performance
- Detailed management blueprints are needed in terms of establishment, grazing and maintenance (persistence) of MSS
- Direct environmental impacts need to be measured under Irish conditions
- MSS are not a silver bullet solution but will form part of an array of solutions available to farmers into the future



Questions?