

The effect of sward type on lamb performance and methane output in the post-weaning period



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Irish lamb production system



2.66 million breeding ewes



**1.37 lambs weaned per ewe
→ 1.55 by 2027**



Input cost and availability



Feed

Land

Fertiliser

**Pressure to reduce
GHG emissions from
livestock production**



Challenge to finish lambs



**Adapt and improve lamb
finishing systems**

The potential of diverse pastures



Ability to fix atmospheric nitrogen (100-200+ kg N/ha/yr)



Deep tap roots providing drought tolerance and additional minerals from the soil



Improved sward quality (Late summer/Autumn)



Increased animal intakes and performance

Objective

- To evaluate the effect of sward type on lamb growth performance and methane output in the post-weaning period

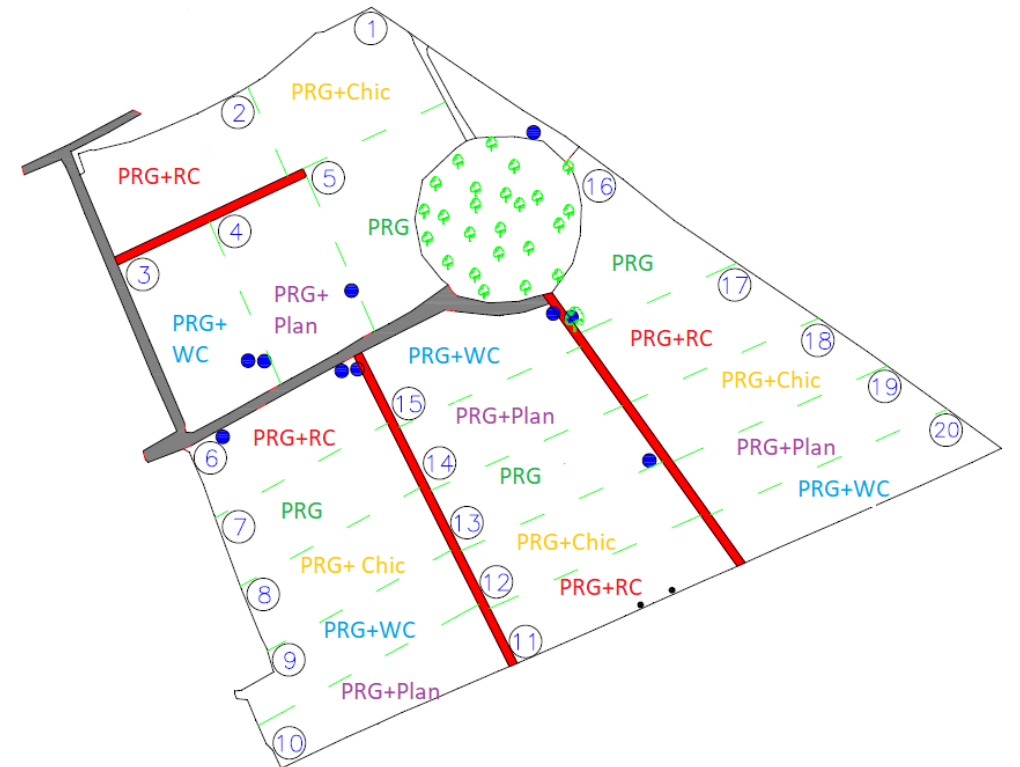


Sward Treatments

- Perennial ryegrass (PRG)
- PRG + White Clover (PRG+WC)
- PRG + Red Clover (PRG+RC)
- PRG + Chicory (PRG+Chic)
- PRG + Plantain (PRG+Plan)

Methods

- 24 Belclare X Texel ewes and their lambs per treatment
- Farmlet system established
- Stocking rate of 11.5 ewes/ha
- Grazing systems
 - Pre-weaning: Rotational
 - Post-weaning: Leader follower
- Swards received 120 kg N/ha/yr



Methods



Lambing



Lamb Selection



Measurements



October -
November

February -
April

June

July-
September

September-
November

Mating



Weaning



Slaughter



Poster presentation

The effect of sward type on the meat eating quality of lamb



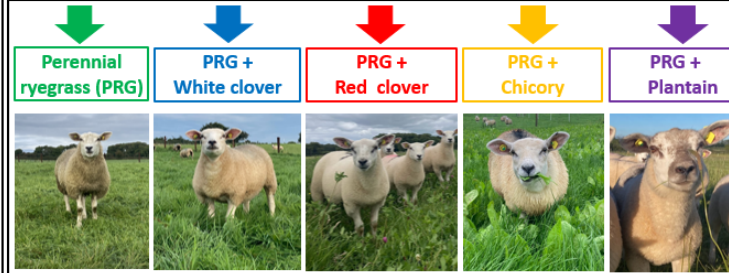
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Objective

To assess the sensory quality of meat produced from lambs grazing differing sward types

Materials and Methods

- 60 Texel X lambs (n=12)
- Balanced for treatment, wean weight and sex
- Slaughtered to a target carcass weight of 20kg
- *M. longissimus thoracis et lumborum* muscle cut from each carcass



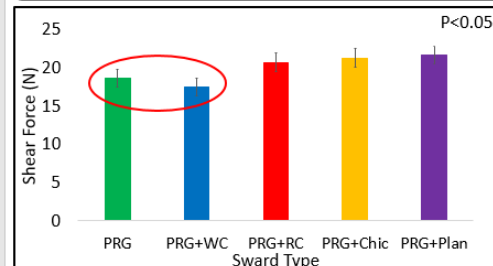
Results

Trained Objective Sensory Panel



	PRG	PRG+WC	PRG+RC	PRG+Chic	PRG+Plan	SEM	P-value
Initial Tenderness	7.66 ^a	7.71 ^a	7.75 ^a	7.39 ^a	6.72 ^b	0.189	<0.0001
Juiciness	6.80	6.60	6.88	6.77	6.71	0.324	NS
Tenderness	7.24 ^a	7.27 ^a	7.09 ^a	6.91 ^a	6.23 ^b	0.183	<0.0001
Flavour	5.70 ^{ab}	5.27 ^{bc}	5.70 ^b	4.84 ^c	4.98 ^c	0.268	<0.0001

Warner Bratzler Shear Force



Consumer Sensory Panel



	PRG	PRG+WC	PRG+RC	PRG+Chic	PRG+Plan	SEM	P-value
Tenderness	7.50 ^a	7.29 ^a	7.08 ^{ab}	7.01 ^{ab}	6.46 ^b	0.263	<0.05
Juiciness	7.22 ^{ab}	7.32 ^a	7.17 ^{ab}	7.03 ^{ab}	6.47 ^b	0.265	<0.01
Flavour	7.24 ^a	7.18 ^a	6.96 ^{ab}	6.93 ^{ab}	6.25 ^b	0.273	<0.01
Overall liking	7.42 ^a	7.35 ^a	7.07 ^{ab}	7.21 ^a	6.29 ^b	0.268	<0.01
Quality	2.91 ^a	2.89 ^a	2.76 ^{ab}	2.71 ^{ab}	2.43 ^b	0.113	<0.01

Conclusions

- ✓ Meat tenderness and juiciness was increased in lambs finished on PRG or PRG+WC
- ✓ Trained and consumer panels had a lower acceptance for meat produced from lambs finished on PRG+Plan
- ✓ Lambs finished on PRG+Plan had greater shear force values than lambs finished on PRG or PRG+WC

Methane measurements

- Portable Accumulation Chambers (PAC)
- Off feed for a minimum of 1hr
- 50 minutes in the PAC
- Methane, oxygen and carbon dioxide measurements taken at 3 time points
- 12 chambers



Statistical analysis

Performance



Fixed effects

Treatment, year,
litter size, sex and
dam parity

Random effects

Dam

Methane



Fixed effects

Treatment, litter size,
dam parity, **chamber**,
weight

Random effects

Date, lot number

Sward



Fixed effects

Rotation, year,
treatment and
treatment*rotation

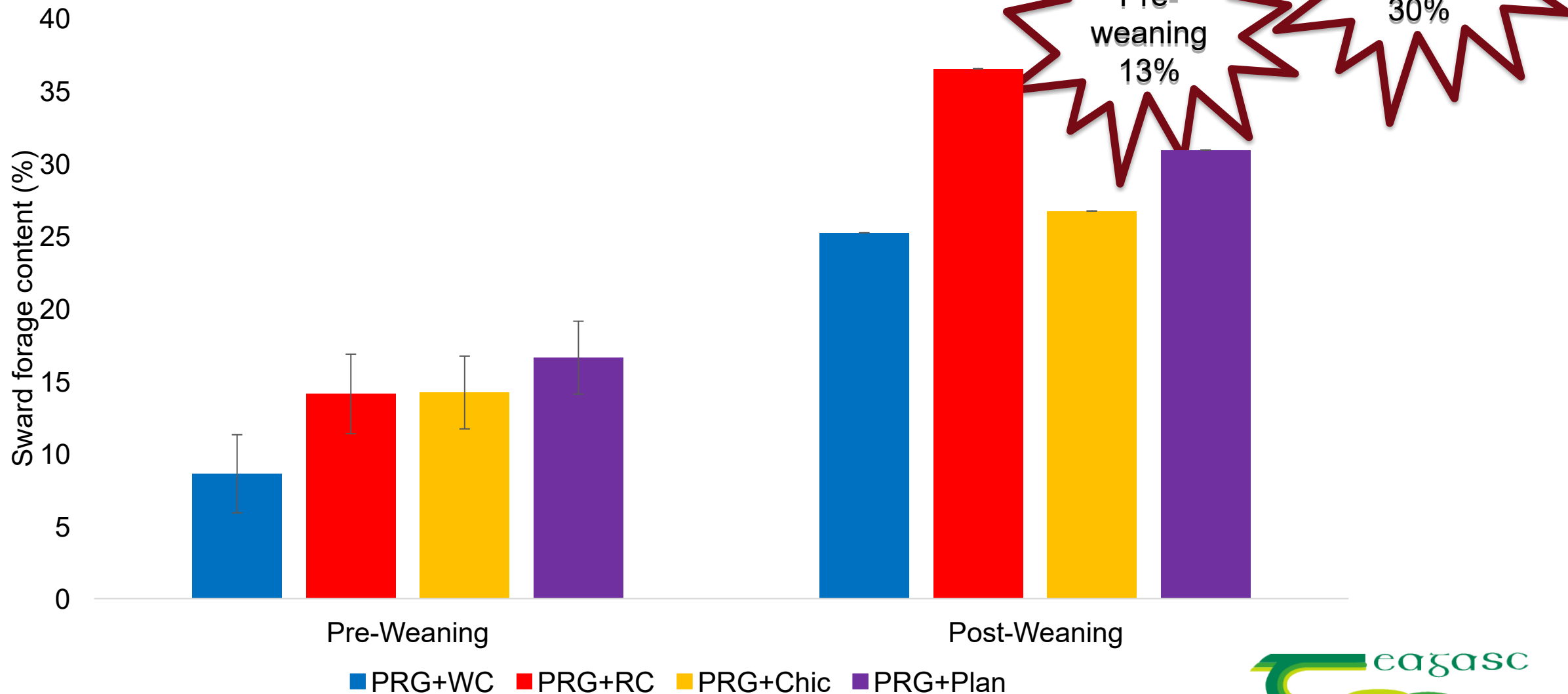
Random effects

Paddock



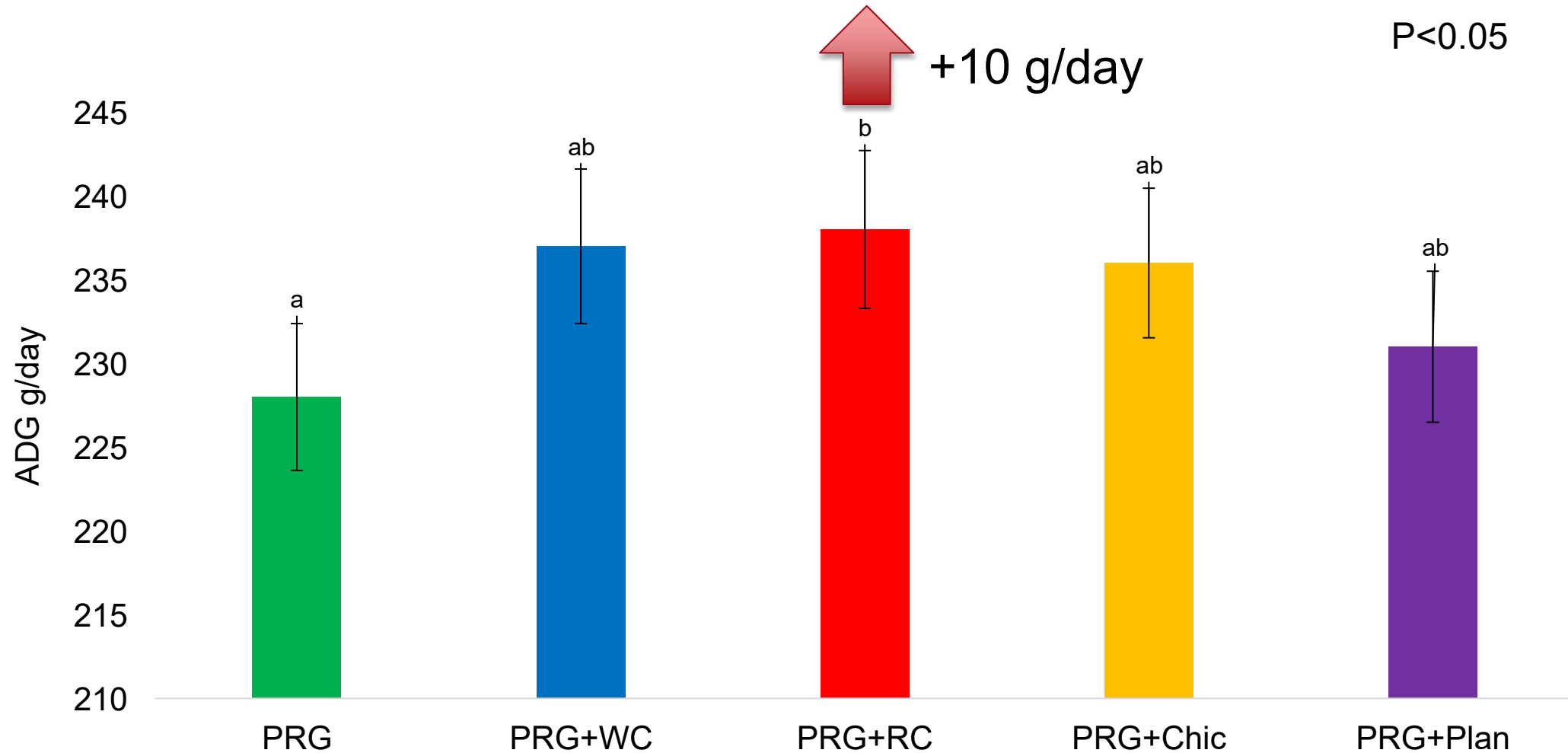
Results

Average sward forage contents

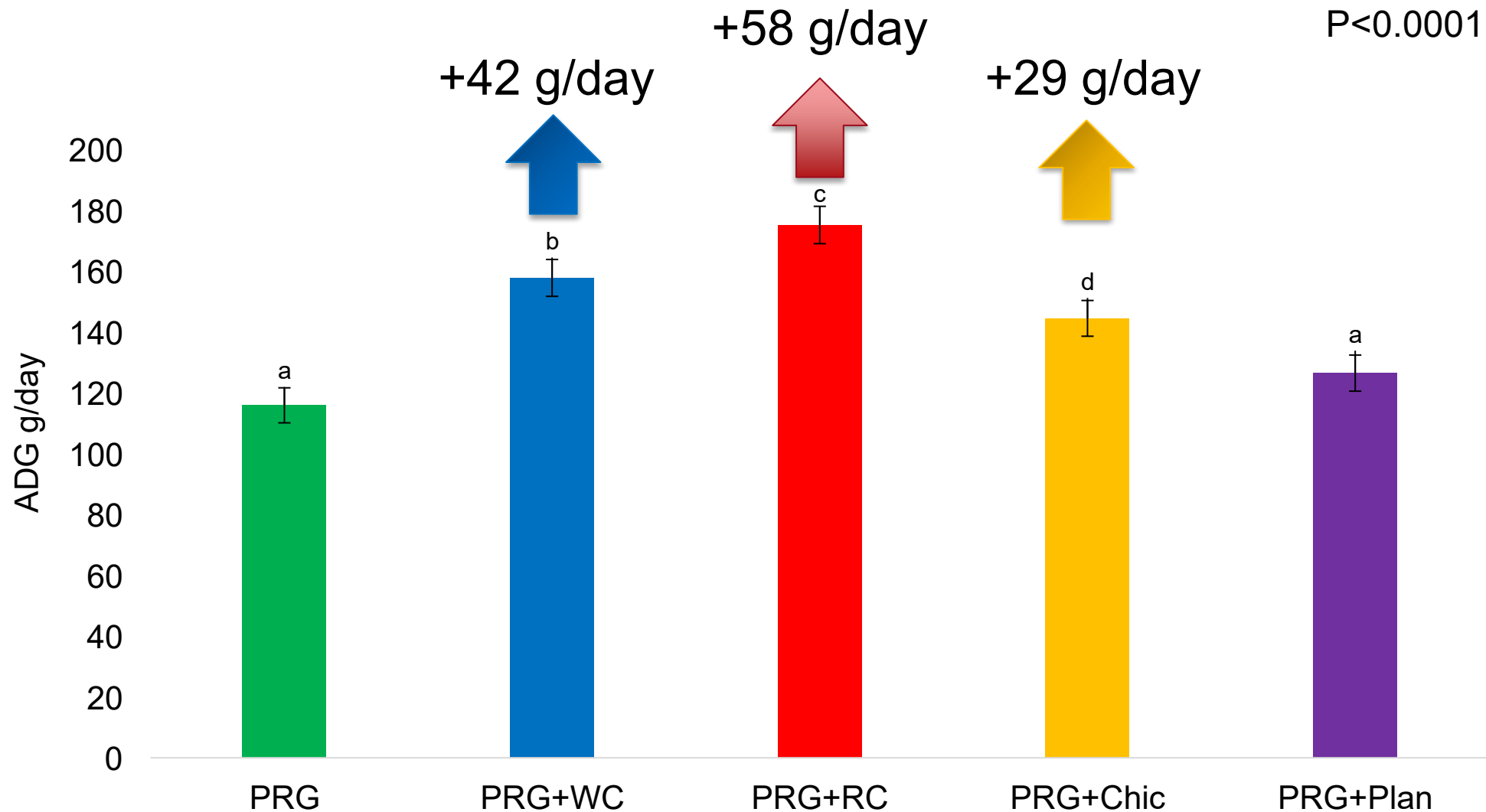


Pre-weaning lamb performance

P<0.05

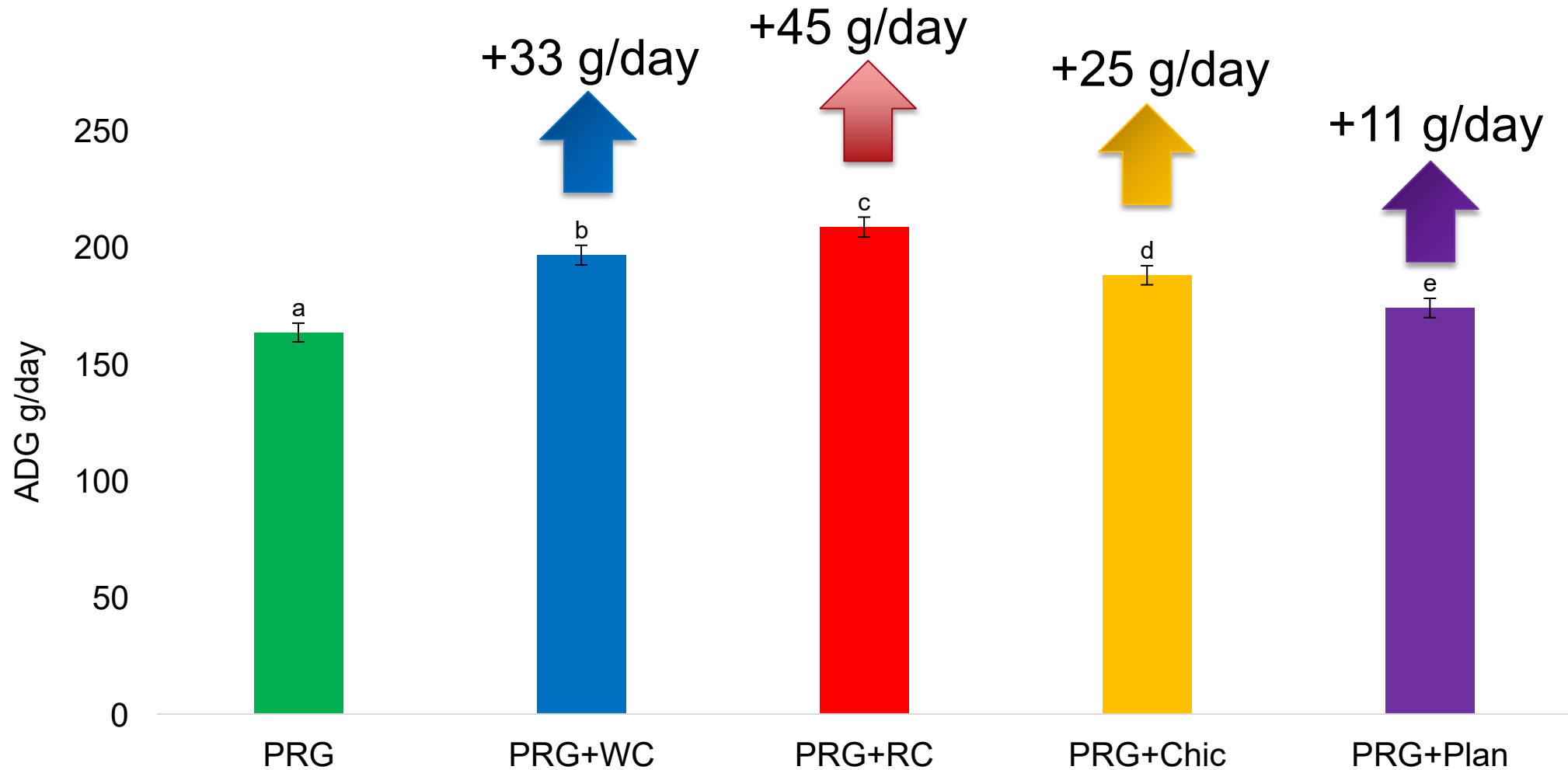


Post-weaning lamb performance

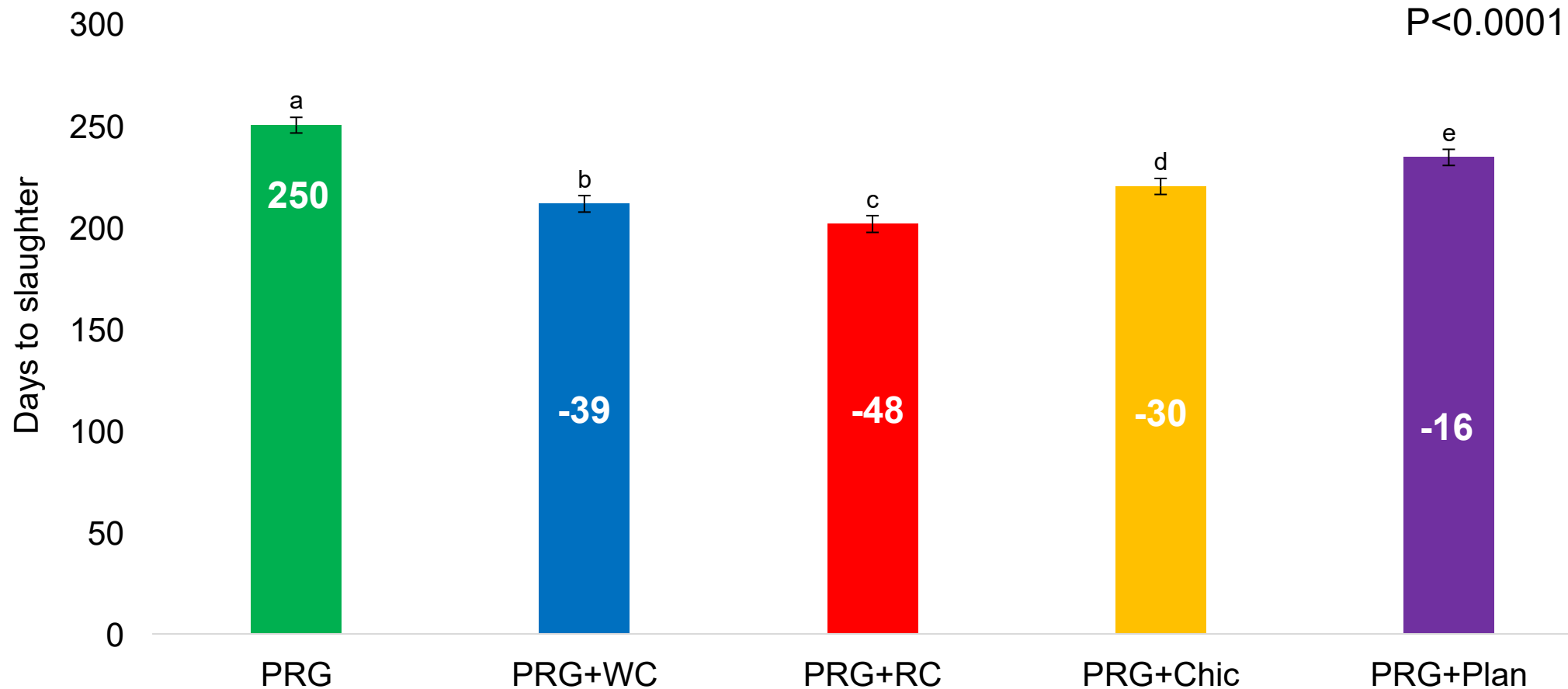


Lifetime lamb performance

P<0.0001



Days required for lambs to reach slaughter



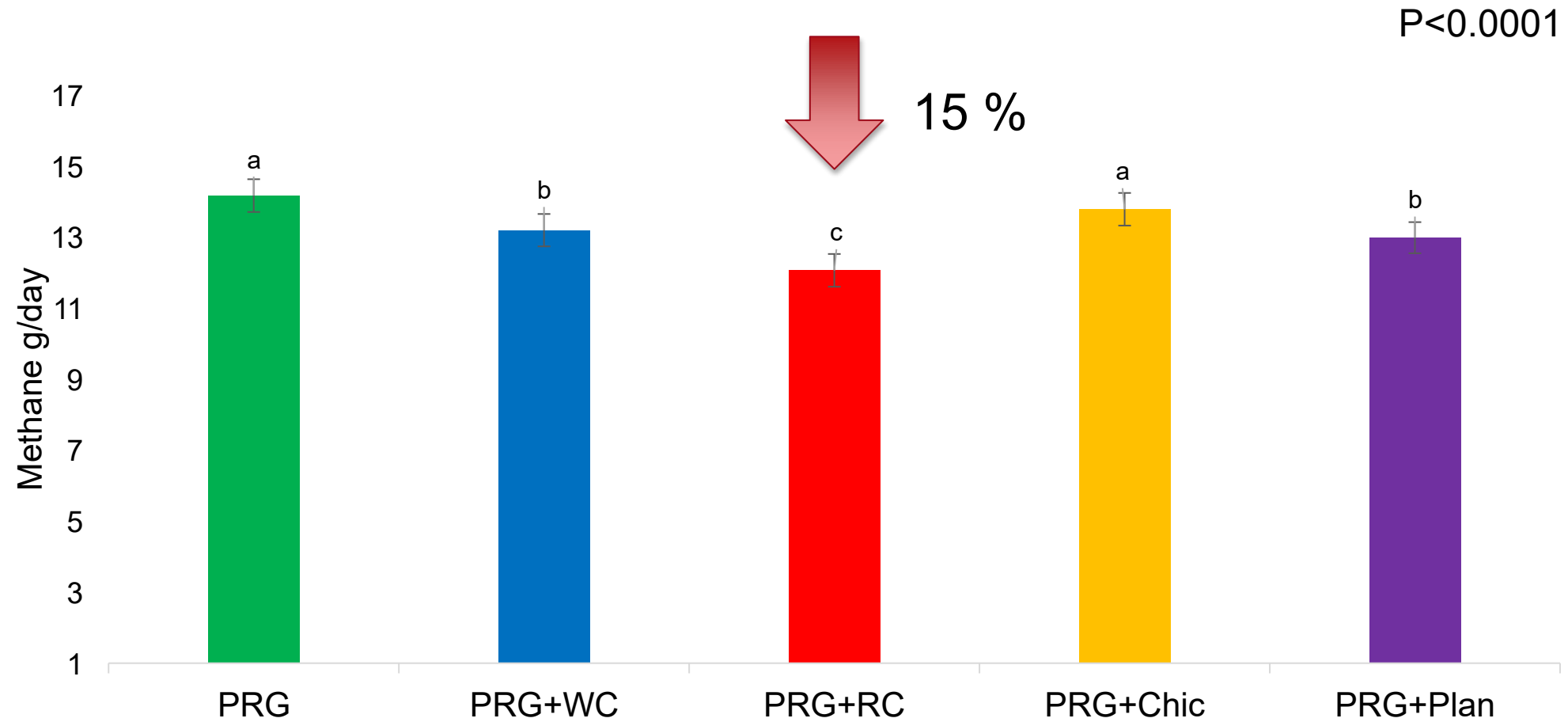
Sward chemical composition

Selective herbage samples obtained the morning of each PAC measurement



	PRG	PRG +WC	PRG+RC	PRG+Chic	PRG+Plan	SEM	P-value
OMD	709 ^a	753 ^b	754 ^b	749 ^b	728 ^{ab}	13.6	0.05
CP	149 ^a	186 ^b	179 ^b	138 ^a	119 ^c	6.90	0.001
NDF	420 ^a	364 ^b	380 ^b	362 ^b	379 ^b	13.02	0.05
ADF	236 ^a	186 ^b	192 ^b	187 ^b	211 ^{ab}	13.62	0.01
Ash	85.4 ^a	85.1 ^a	91.1 ^{ab}	92.8 ^b	94.6 ^b	2.72	0.05

Methane output





Conclusions

- Sward companion forage content peaked in the post-weaning period
- Lamb performance was significantly improved with the addition of any companion forage post-weaning
- Companion forage inclusion enhanced the chemical composition of the sward
- Lambs grazing PRG+RC had the most superior growth performance and ranked lowest for methane output

Thank you for listening



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