**Application**

Enhancing growth rates in perennialryegrass lamb finishing systems through the addition of herbs and legumes to the sward.

 **Introduction**

Pasture based systems are fundamental to ruminant production in temperate regions. Pasture based systems are dominated by perennial ryegrass which offers a favourable early summer growth pattern and high dry matter (DM) yields. Pre weaning it can support the nutritional needs of lactating ewes and their lambs (Grace et al., 2019).

In many pasture based sheep systems, post-weaning lamb performance is sub optimal as grass quality reduces as the grazing season progresses, requiring costly concentrate supplementation to achieve optimum finishing weights. The addition of summer active legumes and herbs to monocultures of perennial ryegrass can boost sward quality in the post weaning period (Golding et al., 2011), while also supplementing the seasonal growth pattern of perennial ryegrass swards.

**Method**

Three sward types were investigated using a randomized block design. Sward types investigated included perennial ryegrass (*Lolium perenne L*.; PRG), PRG plus white clover (*Trifolium repens* L; PRG + WC) and PRG, WC plus plantain (Plantago *lanceolate* L.; PRG + WC + Plan). Companion forage content was calculated as a percentage of the total sward on a dry matter basis. Three farmlets were established to investigate each sward treatment. Each flock consisted of 100 ewes with an average litter size of 1.8 lambs/ewe, with a mean lambing date of the 8th of March. Lambs were turned out to their respective treatment groups 24 - 36 hours post lambing and remained in these groups until drafted for slaughter. Each flock was managed as a rotational grazing system pre-weaning and a leader follower grazing system was implemented post-weaning, where lambs were grazed ahead of the ewes and were removed from the paddock when a target post grazing sward height of 6 cm was reached. Ewes were then introduced to graze down to a residual of 4.5 cm. Lambs were weaned at an average of 14 weeks of age. Lambs were weighed fortnightly from the point of weaning and drafted accordingly to achieve a target carcass weight of 20 kg.

Data were analysed using a linear mixed model, PROC MIXED in SAS. Fixed effects of treatment, litter size and sex were included in the model for all lamb performance traits.

**Results**

Results are presented in Table 1. Lamb weaning weight was similar across sward treatments (*P >* 0.05) with an average weight of 28.7 kg. Lambs grazing PRG + WC and PRG + WC + Plan had a higher post weaning average daily gain (ADG) (*P* < 0.01) of +17.5 g/day, on average. Lambs grazing PRG + WC + Plan had a higher lifetime ADG (*P <* 0.05) than those grazing PRG. Slaughter weight was unaffected by sward treatments averaging 46.5kg. Pre-grazing yields for the PRG, PRG + WC and the PRG + WC + Plan swards were similar across treatments averaging 1311kg DM/ha . The average WC content of the PRG + WC sward post weaning was 9 %, while The PRG + WC + Plan sward had a WC content post weaning of 10 % and a Plan content of 14 %, giving a total companion forage content of 24 % in the PRG + WC + Plan sward.

Table 1. The effect of sward type on lamb growth performance in the post-weaning period.

|  |  |  |
| --- | --- | --- |
|  |  |  Sward Type1 |
|  | PRG | PRG + WC | PRG + WC + Plan | SEM | P-value |
| *Lamb performance* |  |  |  |  |  |
| Weaning weightPost-weaning ADG2 | 29.5162a | 28.2179b | 28.5180b | 0.530.50 | NS<0.01 |
| Lifetime ADGSlaughter weight | 207a46.2 | 213ab46.6 | 216b46.9 | 0.300.40 | <0.05NS |
| *Sward parameters* Pre-grazing yield, kg DM/haPost grazing sward height (cm) | 13326.4 | 13276.6 | 12756.1 | 87.5729.31 | NSNS |

a-b Values within rows with different superscripts differ at *P <* 0.05; 1PRG = perennial ryegrass, PRG + WC = perennial ryegrass and white clover, PRG + WC + Plan = perennial ryegrass, white clover plus plantain; 2ADG = average daily gain.

**Conclusion**

The results from this study support the use of more diverse swards compared to PRG monocultures in the post-weaning period to support enhanced animal performance. However, incorporating Plan into the PRG + WC sward did not result in significant additional benefits for animal performance compared to the PRG + WC sward alone. The plantain content in the sward may have been insufficient to promote further lamb growth.

**References**

GOLDING, K., WILSON, E., KEMP, P., PAIN, S., KENYON, P., MORRIS, S. & HUTTON, P. 2011. *Animal Production Science,* 51**,** 717-723.

GRACE, C., LYNCH, M. B., SHERIDAN, H., LOTT, S., FRITCH, R. & BOLAND, T. M. 2019. *Animal,* 13**,** 1721-1729.