

A comparison of growth and carcass characteristics of hill lambs finished on a selection of forage-based diets

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Introduction Finishing hill lambs on lowland farms is an important feature of the UK sheep industry and a major contributor to the rural economy. Historically, due to their low growth potential, hill lambs were finished on high grain diets in order to achieve moderate-to-high growth rates. However, concentrate feed costs have increased significantly in recent years so that there is a need now to investigate lower cost forage-based alternatives. Silage-based diets for lambs have been studied extensively and are capable of sustaining growth rates of 80-130 g/d (Carson *et al.*, 2001). Forage maize also can be a high quality feedstuff and has the potential to reduce feeding costs on mixed beef/sheep farms (Keady *et al.*, 2008) but there is only limited information on the performance of lambs fed maize silage-based diets. Grazed grass is the cheapest forage available for lambs, but the low nutritive value of late season grass swards may make grazed grass inadequate to maintain high levels of performance. The aims of the current study were to investigate the performance and carcass characteristics of lambs finished on a range of forage-based diets.

Material and methods In September 2009, 136 castrate male lambs were sourced from six hill farms soon after weaning. Following a 3-week acclimatisation period, the lambs (mean±SD age and live weight 164 ± 11.0 d and 33 ± 5.5 kg respectively), were allocated to 3 treatment groups (n = 38/39) balanced for live weight, genotype, farm of origin and age. Within each treatment group, lambs were randomly allocated for slaughter at 42, 46 and 50 kg live weight. Two treatment groups were housed as groups of six lambs per pen and finished on *ad libitum* grass silage (GS) or *ad libitum* maize silage (MS) and concentrates. The remaining lambs were grazed together on a mixed perennial ryegrass/Italian ryegrass sward (GG). The grass silage was predicted by Near Infrared Reflectance Spectroscopy to contain 228 g DM/kg, 692 g/kg digestible organic matter/kg DM, 11.1 MJ ME/kg DM and 134 g crude-protein/kg DM while maize silage contained 312 g DM/kg, 11.1 MJ ME/kg DM, 97 g CP/kg DM and 269 g starch/kg DM. The grass swards supplied 160 g DM/kg, 9.5 MJ ME/kg DM and 109 g CP/kg DM. All lambs were offered 0.5 kg concentrates once daily but, due to the low CP content of MS, the concentrates fed with MS were formulated to a higher level of CP (222 g/kg DM) than those fed with GG and GS (183 g/kg DM). Silages were offered fresh daily at 0930 h and DM intake was recorded daily until slaughter. Lambs were weighed fortnightly until they reached their target slaughter weight. Cold carcass weight, dressing proportion and grade were recorded at slaughter. Carcass conformation was scored on a 5-point scale using the EUROP classification system (E=5, P=1) while carcass fatness was scored on a 6-point scale using the Livestock and Meat Commission (NI) classification system (1=1, 2=2, 3=3, 4L=4, 4H=4.5 and 5=5). Data were analysed using linear models with fitted fixed effects for farm of origin, carcass weight, diet, genotype and diet x genotype (dietary effects only are presented). Means were predicted for a 20 kg cold carcass weight endpoint.

Results Lambs fed GG had higher live weight gains (+31 g/d; P<0.01) and achieved 20 kg carcass weight on average 22 days earlier than those fed GS (P<0.05). Lambs fed MS consumed 20% more silage DM (P<0.001) and, as a result, achieved 20 g/d higher live weight gains (P<0.01) and were slaughtered 12 days earlier than those fed GS. However MS tended to reduce carcass dressing proportion (P=0.06) and consequently tended to increase (P=0.06) slaughter weight compared with GS, thus reducing the benefits of their higher weight gains for age at slaughter. There was no effect of forage type on carcass conformation score. However lambs finished outdoors on GG had lower (P<0.001) fat scores compared with those finished indoors on silage-based diets.

Table 1 Effects of forage type on the performance and carcass characteristics of hill lambs

Forage	Grazed grass	Grass silage	Maize silage	s.e.d	Probability
Silage dry-matter intake (kg/d)	-	0.44	0.53	0.022	<0.001
Live weight gain (g/d)	116 ^b	85 ^a	105 ^b	7.8	0.002
Slaughter weight (kg)	44.7	44.3	45.5	0.54	0.060
Days to slaughter	116 ^a	138 ^b	126 ^a	6.0	0.012
Conformation score	3.11	2.93	2.95	0.100	0.216
Fat score	2.95 ^a	3.26 ^b	3.34 ^b	0.109	<0.001
Dressing proportion	0.448	0.452	0.440	0.0056	0.064

Means sharing the same letter in their superscript are not significantly different (P>0.05). All lambs offered 0.5 kg/d concentrates.

Conclusion These results show that, under good grazing conditions, grazed grass is superior to high quality grass silage for finishing hill lambs during the autumn/winter. On farms where outdoor finishing is not possible, maize silage is ideal for achieving good growth rates indoors due to its higher intake characteristics compared with grass silage. However, lamb growth rates on forage-based diets are approximately only 50% of the growth rates reported for lambs finished on concentrates.

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References

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