

## Use of forage brassicas and bio-active chicory /plantain/clover mixtures for lamb finishing

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**Introduction** Traditionally UK lamb finishers have used forage brassicas to extend the season of supply of lamb beyond the grazing season. Retailers however can now import low-cost chilled lamb from New Zealand from December to June so financially U.K. supply extension is now more risky. Here, two trials are described to i) evaluate the ability of currently used forage brassicas to finish lambs in Nov/Dec, and to ii) compare the most promising ones with mixtures containing chicory, plantain and clover for finishing lambs in August /Sept. The latter having shown to be bio-active with anthelmintic effects.

**Materials and methods** Five 0.33ha plots of forage brassicas (kale (**K**), rape (**R**), stubble turnips (**T**), hybrid kale/rape (**HB**) and a rape/turnip (**RP**) mixture) were established on an upland (225 m.a.s.l.) old grassland site in Peebleshire (Lat 56 degree N). Crops were sown on 9<sup>th</sup> July (kale on 8<sup>th</sup> June) and lamb performance evaluated from 3<sup>rd</sup> Nov to 12<sup>th</sup> Dec 2007 using 75 store lambs (32-36 kg). Lambs were weighed empty on arrival (day<sub>0</sub>), given an anthelmintic, allocated to the plots balanced for initial live weight and breed (n=15), weighed again on day<sub>30</sub> and slaughtered on day<sub>39</sub>. Lambs had access to mineral/vitamin powder, water and an area of grass runback of approximately 0.07ha. The abattoir recorded carcass weight, fatness and conformation, which were used with body weight data and an estimated carcass weight on day<sub>0</sub> to estimate daily bodyweight gain, killing out percentage and carcass gain. These animal data were used to assess effects of forage brassicas through ANOVA. In 2008 crops were sown earlier (30<sup>th</sup> May), and were a repeat of hybrid kale/rape, *Brassica oleracea/Brassica napus* (**HB**); hybrid kale/rape and chicory/plantain, *B. oleracea/B. napus* and *Cichorium intybus/Plantago major* (**HB/CP**); chicory/plantain/white clover, *C. intybus/P. major* and *Trifolium repens* (**CP/WC**); chicory/plantain/white clover and timothy grass, *C. intybus/P. major/T. repens* and *Phleum pratense* (**CP/WC/T**); and, chicory/plantain with white and red clover, *C. intybus/P. major* and *T. repens/T. pratense* (**CP/WC/R**). These were grazed between 18<sup>th</sup> Aug and 17<sup>th</sup> Sept with parasitised lambs. Lamb liveweight gain and dag score (5 point subjective score for faecal soiling of the breach area) were recorded for all lambs and strongyle faecal egg count (FEC) were recorded for 3 lambs per plot. Data was assessed through ANOVA; FEC were log-transformed and initial FEC was used as a covariate for final FEC.

**Results** In 2007 despite there being significant differences in daily gain on the crop, estimates of daily carcass gain were not significantly different between treatments as there were differences in killing out percentage (refer to Table 1). All crops grew well, the stubble turnips, being sown earlier than normal, had exceptional yields but lambs had difficulty utilising the crop when roots broke free of soil. The HB (cv. Swift) was chosen to compare with chicory/plantain mixes in 2008. The two plots containing HB outyielded the three chicory /plantain mixes (refer to Table 2). They showed significantly higher lamb liveweight gain, whilst it was observed that lambs on HB/CP preferred to eat HB to CP. After 44 days on the crop 90 % of HB and HB/CP lambs were in finished condition versus only 80% of the lambs on the other chicory/plantain mixes. Lamb daily gains on chicory/plantain mixes were lower than expected from previous work where gains over 250g/day were achieved. 2008 was a wet summer and estimates of dry matter content of the brassicas was 87g/kg vs. 67g/kg for chicory/plantain mix suggesting water content of the forages may have constrained intake and performance. Whilst the overall effect of forage approached statistical significance, lambs on the chicory /plantain mixes showed reduced FEC compared to lambs on brassicas (P<0.05 by contrast statement) and the mineral content of the forages was around twice as high. Crop treatment had no significant effect on dag score, but dag score reduced over time across feeding treatments. Dirty fleeces and dags, a common problem with late season lambs, were not seen.

**Table 1** 2007 results

Crops 2007	Fresh yield (t/ha)	Daily gain (g/d)	Carcass gain (g/d)	Killing out (%)
R	40	185	128	46.7
T	114	209	133	45.4
HB	51	246	143	45.1
K	58	210	132	45.7
RP	44	251	135	44.2
s.e.d		24	9.8	0.84
P-value		<0.05	NS	0.05

**Table 2** 2008 results

Crops 2008	Fresh yield (t/ha)	Initial FEC (epg)	Final FEC (epg)	Daily gain (g/d)	Final dag score
HB	55	227	959	184	1.4
HB/CP	41	253	656	215	1.4
CP/WC	39	223	335	130	1.4
CP/WC/T	34	139	425	102	1.8
CP/WC/RC	40	111	258	127	2.0
s.e.d.				24	
P-value			0.12	<0.05	NS

**Conclusions** Forage crops grazed *in situ* can add value and weight to lambs at low cost and improve efficiency of production by releasing grazing for ewes when lambs are marketed earlier. These UK trials with chicory /plantain mixes in a wet year have failed to show the exceptional gains typical of New Zealand trials but show promise as bio-active forages that reduce the need for worming and that improved trace element /mineral status of lambs. Further evaluation is justifiable.

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