

Effect of chicory grazing on killing out percentage and meat eating quality in lambs

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Introduction A growing body of evidence shows that lambs grazing pure stands chicory grow faster, and thus finish earlier in the season, and have lower levels of parasitism (Athanasidou *et al.*, 2007; Kidane *et al.*, 2009). However, it is not known if chicory affects meat eating quality, although carcasses may be leaner when market weights are reached, compared to a more slowly finishing on grass/clover mixtures. Dietary influences on meat quality should be considered as these are very relevant for consumer acceptance. Here, we assessed the effect of chicory grazing on killing out percentage and meat eating quality in lambs.

Materials and methods Lambs grazed pure stands of chicory (CH) or grass/clover (GC) from turn-out at ~32 days of age for ~20 weeks. Body weight (BW) taken just before slaughter and carcass weights (CW) defined killing out percentage as (CW/BW)*100%. Carcasses were hip-suspended at 2°C for 24 h before posterior 20 cm of left loins were retrieved, matured at 2°C for another 9 days in vacuum bags and frozen pending sensory quality assessment at University of Bristol. Loins were thawed overnight, de-boned on the day of assessment, cut in 8-10 2-cm thick samples and cooked until internal temperature reached 75°C. Samples were placed in an incubator (60 °C) prior to sampling by 10 qualified assessors, who were asked to rate 8 point category scales for tenderness, juiciness, lamb flavour intensity, abnormal lamb flavour intensity and two hedonic scales for flavour liking and overall liking. In addition, a thirteen descriptor flavour profile, using unstructured 100 mm intensity scales, was also used (0: nil intensity; 100: extreme intensity). Lambs were allocated to different sub-panels by sex. Reported results were derived from an ANOVA using REML.

Results CH and GC lambs weighed 39.1 and 36.4 kg (s.e.d. 1.35 kg; P=0.051) and killing out percentages were 39.9 and 37.2% (s.e.d. 1.00; P=0.01), respectively. Table 1 shows sensory results using data pooled across panels. Female CH lambs had juicier loins than GC lambs with reduced grassy flavour. However, in some sub-panels, effects on juiciness were stronger (5.2 vs 4.7; s.e.d. 0.36; P<0.001) and CH loins were scored more tender than GC loins (5.6 vs 5.1; s.e.d. 0.37; P<0.01) with a higher livery flavour (11.8 vs 5.4; s.e.d. 7.0; P=0.050). In the pooled data, no effects were observed for castrated lambs, although some sub-panels scored CH loins as higher acidic (8.3 vs 3.6; s.e.d. 4.1; P<0.05), rancidness (5.0 vs 1.0; s.e.d. 3.2; P<0.05), more tender (6.2 vs 5.0; s.e.d. 0.83; P<0.05) and with greater lamb flavour (4.5 vs 3.3; s.e.d. 0.79; P<0.01) than GC loins. Other descriptors (fatty/greasy, kidney, bitter, sweet, ammonia, fishy, soapy and dairy) and hedonic flavour and overall liking did not differ between CH and GC lambs, although in one sub-panel overall liking of CH loins was scored higher than GC loins (4.6 vs 3.5; s.e.d. 0.82; P<0.05).

Table 1 Effect of forage type on sensory quality of loins from female and castrated lambs

	Female lambs				Castrated lambs			
	Chicory	Control	s.e.d.	P-value	Chicory	Control	s.e.d.	P-value
<i>8 point scale used</i>								
Texture	5.5	5.2	0.25	NS	5.2	5.5	0.20	NS
Juiciness	5.2	4.9	0.14	0.025	5.0	4.9	0.14	NS
Lamb flavour	4.2	4.4	0.30	NS	4.1	4.2	0.19	NS
Abnormal flavour	2.4	2.0	0.28	NS	2.5	2.4	0.15	NS
<i>Hedonic</i>								
Flavour liking	5.1	5.2	0.29	NS	4.8	4.8	0.19	NS
Overall liking	5.1	5.1	0.27	NS	4.7	4.7	0.20	NS
<i>100 mm line scale used</i>								
Livery	11.2	7.2	3.01	NS	9.9	10.5	1.88	NS
Rancid	0.7	0.5	0.55	NS	2.8	1.1	1.63	NS
Acidic	6.6	4.0	2.03	NS	6.7	4.2	1.65	NS
Grassy	6.2	10.6	2.37	0.077	9.9	9.1	1.64	NS

Conclusion These results suggest that grazing on chicory produces heavier carcasses with better killing out percentage, and increased loin juiciness, although the latter in female lambs only. Beneficial sensory scores for eating quality were given to chicory-reared lamb in several sub-sets but were cancelled out when data was pooled, suggesting the need for relatively large numbers of observations to avoid drawing invalid conclusions. Although it can not be excluded that sex-specific effects observed in this study would not be present had lambs been finished to commercial standards, overall the data suggest that using chicory as an alternative crop for finishing lambs is expected to yield higher carcass weights without detrimental effects on meat eating quality.

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References

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