

## Use of green sulla forage for feeding. 2. Effects on lamb carcass and meat quality

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**Introduction** Diets with 2.5% of condensed tannins (CT) from carob pulp have been showed to reduce lamb carcass weight, yield and fatness, as a consequence of lower digestibility due to strong protein-tannin bonds. Moreover the diets lightened meat colour and negatively affected meat sensory properties (Priolo *et al.*, 2000). There is evidence that some tannin-rich legumes have weaker stability of the protein-tannin complex post-rumen (McSweeney *et al.*, 2001). Since the CT-containing sulla (*Hedysarum coronarium* L.) demonstrated improved lamb growth performance in comparison with CT-lacking annual ryegrass (*Lolium multiflorum* Lam. subsp. *wersterwoldicum*) (Giambalvo *et al.*, 2005), this study examined the impact of CT from sulla on carcass characteristics and meat quality.

**Materials and methods** Thirty-two male Comisana lambs, fed green forage of sulla (S=16) or ryegrass (R=16) and 200 g/head per d of a concentrate, were slaughtered at 150d of age. Weights of carcass, perirenal and pelvic fat and gastrointestinal content were recorded. Tissue components in the hind leg were determined. Meat quality was evaluated by pH, colour (L\* a\* b\*, hue, chroma), thawing and cooking loss, Warner-Bratzel (WB) shear force determination and chemical analysis on *Longissimus dorsi* (LD) muscle. A panel of 28 members assessed in two sessions the meat in triangle tests. Data were analysed by the GLM procedure of SAS.

**Results** Lambs fed sulla forage had higher empty body weight than R lambs, so that they gave heavier carcass with higher dressing percentage and fatness (Table 1). As a consequence, S lambs showed higher incidence of fat tissue in hind leg and more lipids in LD muscle. Diet did not modify physical characteristics of LD meat (Table 2). Particularly, meat colour parameters (Table 2) were not affected by forage, in contrast to Priolo *et al.* (2000), although the level of CT found in the sulla (1.7% on average, ranging from 1.5 to 2.3%) was lower than that of carob pulp studied by these authors. In the triangle test, sensory panellists were unable to distinguish meat from the different forages at a significant level (21/56 correct indications).

**Table 1** Performance of lambs at slaughter (a, b: P<0.05; A, B: P<0.01)

		Sulla	Ryegrass
Empty body weight	kg	24.3 A	19.7 B
Carcass at 24 h (CR)	kg	12.5 A	9.6 B
Net dressing at 24 h	%	51.3 A	48.7 B
Hind leg	kg	2.0 A	1.6 B
Hind leg	% CR	15.9	16.2
Periral and pelvic fat	g	133.8 A	82.8 B
Periral and pelvic fat	% CR	1.1 a	0.8 b

**Table 2** Physical quality of *Longissimus dorsi* meat (no significant differences)

		Sulla	Ryegrass
pH at 24 h		5.9	6.0
Thawing loss	%	4.6	3.7
Cooking loss	%	25.5	26.3
Total loss	%	28.9	29.0
WB shear force	kg/cm <sup>2</sup>	3.6	3.4
Lightness (L*)		36.8	38
Redness (a*)		14.8	14.2
Yellowness (b*)		7.8	7.5
Chroma		16.8	16.2
Hue angle		27.7	27.8

**Conclusions** A legume containing CT improved lamb carcass characteristics and did not negatively influence the rheological and sensoral properties of lamb meat. The beneficial effects of sulla could depend on the low content and type of tannins.

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### References

- Giambalvo D., A. Di Grigoli, M.L. Alicata, B. Formoso, A.S. Frenda & P. Trapani (2005). The feeding green forage of sulla. 1. Effects on lamb growth and gastrointestinal nematode parasite infestation. *XX International Grassland Congress – offered papers* (in press).
- McSweeney, C.S., B. Palmer, D.M. McNeill & D.O. Krause (2001). Microbial interactions with tannins: nutritional consequences for ruminants. *Animal Feed Science and Technology*, 91, 83-93.
- Priolo, A., G.C. Waghorn, M. Lanza, L. Biondi & P. Pennisi (2000). Polyethylene glycol as a means for reducing the impact of condensed tannins in carob pulp: effects on lamb growth performance and meat quality. *Journal of Animal Science*, 78, 810-816.