

## THE EFFECTS OF GLAND CLOVER (*TRIFOLIUM GLANDULIFERUM*) CONSUMPTION ON SHEEP PRODUCTION AND MEAT EATING QUALITY

D.G. MASTERS<sup>A</sup>, G. MATA<sup>A</sup>, C.K. REVELL<sup>B</sup> and V. SOLAH<sup>C</sup>

<sup>A</sup> CSIRO Livestock Industries, Private Bag No 5, Wembley, WA 6913

<sup>B</sup> Department of Agriculture Western Australia, Centre for Cropping Systems, PO Box 483, Northam, WA 6401

<sup>C</sup> Department of Nutrition, Dietetics and Food Science, Curtin University of Technology, GPO Box U1987, Perth, WA 6845

Gland clover (*Trifolium glanduliferum*) is a new clover species to Australia. The plant contains coumarin, which, during mould-induced spoilage, is converted to dicoumarol. High intakes of dicoumarol inhibit blood clotting and may affect meat flavour (Blood *et al.* 1985). This experiment evaluated the effects of gland clover consumption on production and meat quality of hogget sheep.

On July 3-6, 2000, 4 plots (0.5 ha each) were sown with Prima gland clover and 4 with Dalkeith sub. clover (*Trifolium subterraneum*) at the CSIRO Research Station, Bakers Hill, WA. On Sept, 7, 2000, 2, 14-month-old Merino ewes were allocated to each plot; 2 more were added on Sept 28 and Oct 19. By Nov 9, 2 sheep per plot had grazed the experimental clovers for each of 3, 6 and 9 weeks.

The 2 sheep on each plot for the full 9 weeks were weighed and had midside wool samples collected every 3 weeks. Estimates of food on offer (FOO) were made on Sept 9 and 28, Oct 19 and Nov 9. After slaughter at a commercial abattoir on Nov 10, the carcasses were hung for 3 days in the chiller before removal of the *Longissimus dorsi* muscle for evaluation of flavour, tenderness and juiciness by a trained panel. The panel also assessed differences between the test samples and a standard lamb sample in a triangle test (Meilgaard *et al.* 1991). Plot means were compared using ANOVA.

There were no significant differences in liveweight gain (Prima  $274 \pm 16$  vs. Dalkeith  $251 \pm 16$  g/d) or clean wool growth (Prima  $0.16 \pm 0.01$  vs. Dalkeith  $0.16 \pm 0.01$  g/100 cm<sup>2</sup>.d) over the 9 weeks of the experiment. There was significantly more ( $P < 0.05$ ) FOO on the Prima gland clover plots on Sept 9 ( $1624 \pm 64$  vs.  $911 \pm 64$  kg DM/ha) and 28 ( $3304 \pm 85$  vs.  $2978 \pm 85$  kg DM/ha), but significantly more Dalkeith clover on Oct 19 ( $3561 \pm 83$  vs.  $3207 \pm 83$  kg DM/ha).

**Table 1. Tenderness, juiciness and flavour of meat from sheep grazing Prima gland or Dalkeith clover**

Clover type	Exposure	Flavour <sup>A</sup>	Tenderness <sup>B</sup>	Juiciness <sup>C</sup>
Prima gland	3 weeks	6.7	8.6	5.1
	6 weeks	6.4	8.6	5.9
	9 weeks	6.9	8.8	5.3
Dalkeith	3 weeks	6.5	8.5	6.2
	6 weeks	6.6	8.4	5.8
	9 weeks	6.8	8.6	7.0
Standard error of means		0.29	0.13	0.46
Significant effects ( $P < 0.05$ )		ns	ns	Clover

<sup>A</sup>Scale: 1 - extremely bland to 10 - extremely intense. <sup>B</sup>Scale: 1 - extremely tough to 10 - extremely tender. <sup>C</sup>Scale: 1 - extremely dry to 10 - extremely juicy.

There was no effect of clover type on tenderness or intensity of flavour but the gland meat was slightly drier (Table 1). For samples that were detected as different from standard lamb in the triangle test, the panelists indicated gland had a slightly more pleasant taste than standard lamb or Dalkeith samples.

In conclusion, the sheep grew well on Prima gland clover with no detrimental effects on meat quality. The gland clover in this experiment was not subject to spoilage and only contained moderate levels of coumarin (50- 200 mg/kg DM), therefore, further monitoring under a range of conditions is advisable.

BLOOD, D.C., RADOSTITS, O.M. and HENDERSON, J.A. (1985). 'Veterinary Medicine'. 6<sup>th</sup> Edition. (Baillière Tindall: London).

MEILGAARD, M., CIVILLE, G. and CARR, B.T. (1991). 'Sensory Evaluation Techniques' 2<sup>nd</sup> Edition. (CRC Press Inc.: Boston).

Email: David.Masters@csiro.au