

## Relationship of diet quality to green herbage available on lucerne-subterranean clover pastures

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It is difficult to predict diet quality from pasture because diet selection varies with animal type and pasture conditions. At Wagga Wagga between 1974-77 two grazing experiments examined sheep and cattle performance from lucerne and subterranean clover pastures and diet samples were collected and related to available green herbage.

### Methods

Oesophageally fistulated wethers or ewes rotationally grazed (3 week graze/ 6 week spell) lucerne-subterranean clover pastures (LC) and diet samples were obtained on days 3,7,14 and 21 during nineteen grazing rotations from 1975-77. Oesophageally fistulated steers grazed adjacent LC or subterranean clover (C) pastures and diet samples were obtained on days 3 or 21 of each alternate rotation grazing period, or every 21 days when pastures were continuously grazed (winter to mid spring) in 1976 and 1977. The sheep stocking rate averaged 11/ha, and cattle 2/ha. The botanical composition by weight, *in vitro* organic matter digestibility and nitrogen content were assessed (1). Available green pasture was measured by relating visual or pasture probe scores to quadrat cuts on the day diet samples were collected.

### Results and Discussion

Green material in the diet (Yg) or digestibility (Yd) were related to green herbage available (x). Sheep LC  
 $Yg = 88.2 (1 - 0.99249^x) R^2 = 0.63$ ;

Cattle LC  $Yg = 88.3 (1 - e^{-0.00222x}) R^2 = 0.57 (1)$  ;

Cattle C  $Yg = 95.4 (1 - e^{-0.00129x}) R^2 = 0.77 (1)$  ;

Sheep LC  $Yd = 76.6 - 29.8 (0.992289^x) R^2 = 0.61$ ;

Cattle LC  $Yd = 73.8 (1 - 0.424e^{-0.00380x}) R^2 = 0.59$ .

On cattle C pastures, weeds, predominantly Polygonum aviculare, severely reduced digestibility even when green, and percent weeds on the diet (z) was included in the equation;

Cattle C  $Yd = 80.5 (1 - 0.366e^{-0.000804x}) - 0.198z R^2 = 0.43$ .

As available green herbage increases, digestibility and green material in the diet increase reaching similar plateau values in all three cases. The predicted rate of increase is highest for sheep LC and lowest for cattle C which results in diet quality at equivalent values under 2000kg/ha being greatest for sheep LC and least for cattle C (Table 1). Sward canopy structures may explain the differences between cattle LC and C pastures.

**Table 1. Predicted green material in the diet and digestibility of the diet of sheep and cattle grazing lucerne-subterranean (LC) or subterranean clover pastures (C) for various levels of green herbage.**

Green Herbage kg/ha	Green Material in Diet (%)			Digestibility of Diet (%)		
	Cattle LC	Cattle C	Sheep LC	Cattle LC	Cattle C	Sheep LC
100	17.6	11.5	46.7	51.7	48.6	62.9
250	37.6	26.3	74.8	61.2	51.7	72.3
500	59.2	55.3	86.2	69.0	56.1	76.6
1000	79.7	69.1	88.2	73.2	62.6	76.6
1500	85.1	81.6	88.2	73.9	67.0	76.6
2000	87.3	88.2	88.2	74.0	69.9	76.6
4000	88.3	94.8	88.2	74.0	74.6	76.6

More variation in diet quality could be explained by including terms for season and pasture digestible dry organic matter. However, pasture green herbage available explained most of the variation in diet quality except on the subterranean clover pasture grazed by cattle.

1. Hall, D.G., Fitzgerald, R.D., Wolfe, E.C. and Cullis, B.R. (1980). *Aust. J. Exp. Agric. Anim. Husband.* 20, 695-702.