

# INTAKE AND PARTIAL DISAPPEARANCE OF ORGANIC MATTER, NITROGEN AND CELL WALL IN THE DIGESTIVE TRACT OF SHEEP GRAZING ERAGROSTIS CURVULA, LUCERNE AND A MIXTURE

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## Introduction

*Eragrostis curvula* is the most important grass for grazing and hay making of the Eastern Highveld region of South Africa. Nutritionally it can be regarded as of average potential but can be fortified when established with lucerne in mixed stands, thereby cutting on fertilizer also (Rethman and de Witt, 1984). While results on sheep liveweight gain and wool growth appear promising, little is known about digesta kinetics. The present study therefore, was designed to investigate whether the introduction of lucerne alters the pattern of ruminal digestion and post-ruminal disappearance of some primary nutritional indicators.

## Materials and Methods

Mature sheep grazed pure swards of lucerne, *E. curvula* and their mixture, established in alternative rows, from November 1987 through April 1988. Pastures were fertilized and irrigated according to local specifications and herbage mass was never limiting. Six sheep per pasture were allocated in switch over design, of which two were cannulated in the rumen, abomasum and terminal ileum. All sheep were equipped with faecal bags. Three oesophageal fistulated sheep per pasture were brought in strategically to collect samples of material selected.

Individual intakes of OM, N and NDF (cell wall) were determined from faeces output and the digestibility in vitro of oesophageal extrusa. Flow of OM, N and NDF were calculated by reference to the Cr-EDTA and Yb-acetate markers (Siddons et al., 1985) that were continuously infused into the rumen by portable peristaltic pumps.

## Results and Discussion

The results are displayed in table 1. Organic matter intake was significantly higher for the

mixture than for lucerne and tended to be higher for *E. curvula*. The rather low intake for lucerne could have been due to subclinical bloat. The ratio lucerne to *E. curvula* selected in the mixture was about 70:30 and the utilization of the mixture shows resemblance to a clover-perennial ryegrass combination reported by Moseley and Jones (1979). Intake of the combination was higher also than intake of clover or grass alone. They concluded that the introduction of clover promoted passage of nutrients through the rumen and an increase in the proportion of digestible OM digested post-ruminally. The lucerne in the present mixture apparently did the same as can be seen from a higher proportion of OM and NDF digested post-

TABLE 1. INTAKE AND DIGESTION OF OM, N AND NDF, AND RUMEN PARAMETERS OF SHEEP ON THREE PASTURES

	Pasture			SEM
	<i>E. curvula</i>	Lucerne	Mixture	
OM intake (g/day)	976 <sup>b</sup>	656 <sup>a</sup>	1058 <sup>b</sup>	60.8
Prop. OM digested in:				
Rumen	0.48 <sup>b</sup>	0.29 <sup>a</sup>	0.40 <sup>b</sup>	0.03
Small intestine	0.12 <sup>a</sup>	0.28 <sup>b</sup>	0.19 <sup>ab</sup>	0.03
Large intestine	0.05 <sup>a</sup>	0.14 <sup>b</sup>	0.11 <sup>ab</sup>	0.02
Total	0.65 <sup>a</sup>	0.71 <sup>b</sup>	0.70 <sup>b</sup>	0.01
N intake (g/day)	28.5 <sup>a</sup>	32.2 <sup>a</sup>	53.3 <sup>b</sup>	2.82
Prop. N digested in:				
Rumen	0.07 <sup>a</sup>	-0.01 <sup>a</sup>	0.24 <sup>b</sup>	0.05
Small intestine	0.61 <sup>ab</sup>	0.74 <sup>b</sup>	0.52 <sup>a</sup>	0.04
Large intestine	0.15	0.14	0.11	0.04
Total	0.84	0.88	0.87	0.03
NDF intake (g/day)	700 <sup>c</sup>	289 <sup>a</sup>	502 <sup>b</sup>	39.8
Prop. NDF digested in:				
Rumen	0.63 <sup>b</sup>	0.35 <sup>a</sup>	0.51 <sup>ab</sup>	0.05
Large intestine	0.04 <sup>a</sup>	0.19 <sup>b</sup>	0.15 <sup>b</sup>	0.03
Total	0.68 <sup>b</sup>	0.57 <sup>a</sup>	0.66 <sup>h</sup>	0.02

<sup>a,b</sup>Different superscripts in the same line denote significant differences ( $P < 0.01$ )

ruminally for the lucerne – *E. curvula* mixture than for *E. curvula* alone. Post-ruminal digestion of N was proportionally less for the mixture than for lucerne or *E. curvula*. However, in terms of g N digested per day in the small intestine the mixture was superior with 27.7 g/day, as against 23.9 for lucerne and 17.5 for *E. curvula*, which substantiates the conclusion of Moseley and Jones (1979).

It is concluded that the introduction of lucerne does alter digesta kinetics of *E. curvula* to the benefit of the animal.

(Key Words: *E. curvula*, Lucerne, Sheep)

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