

INCREASED RUMINAL DIGESTION OF POOR QUALITY ROUGHAGE IN
CATTLE DUE TO DECREASED RATE OF FLOW OF DIGESTA
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The organic matter digestibility (OMD) of herbage grazed by cattle can be as high as 0.8 g/g organic matter (OM). As pasture-age and the cell wall constituents (CWC) of the forage increase, digestibility and digestible OM intake declines. Nitrogen (N) concentrations fall to very low levels at such times (<0.5 g/100 g OM) and CWC rise to above 80 g/100 g OM. Digestibility assessed by *in vitro* analysis shows a steady decline with age with values falling to 0.4 g/g OM or less, whereas measurements of digestibility *in vivo* seldom give values of less than 0.5.

Shown in Table 1 are the approximate age, N concentration and the *in vivo* and *in vitro* digestibility of spear grass (*Heteropogon contortus*), spear grass mixed with lucerne (*Medicago sativa*), and two tropical legumes *Stylosanthes humilis* and *Stylosanthes viscosa*.

TABLE 1
Digestibility of various poor quality forage

No.	Pasture species	Age (d)	N conc. (g/100g OM)	Digestibility (g/g OM)	
				<i>in vivo</i>	<i>in vitro</i>
1	<i>H. contortus</i>	200	0.68	0.49	-
2	<i>H. contortus</i> +10% <i>M. sativa</i>	200	0.93	0.49	-
3	<i>H. contortus</i> +20% <i>M. sativa</i>	200	1.19	0.48	-
4	<i>H. contortus</i> +40% <i>M. sativa</i>	200	1.66	0.50	-
5	<i>H. contortus</i> (grazing)	250	0.65	-	0.40
6	<i>H. contortus</i> (grazing)	170	0.80	-	0.42
7	<i>S. humilis</i> (grazing)	150	1.02	-	0.49
8	<i>S. viscosa</i> (stems)	150	0.94	-	0.40
9	<i>H. contortus</i>	140	0.72	0.56	0.36

The data for samples 1 to 4 were derived from Siebert and Kennedy (1972), sample 5 from Romero (unpublished), samples 6 and 7 from Hunter *et al.* (1976), sample 8 from McIvor (1979) and sample 9 from Hunter and Siebert (unpublished). There was no significant difference in the digestibility of samples 1 to 4 although the proportion of lucerne varied between zero and 40%. Other measurements indicated that the residence time of feed particles in the rumen of cattle fed solely spear grass was greater than in animals fed lucerne, so that a lesser proportion of the spear grass diet passed from the rumen each day. Since the digestibility of all diets over the entire tract was the same then the proportion being digested in the rumen must have increased with the poorer quality diets. Recent measurements of the site of digestion in cattle fed poor quality feed have shown that more than 80% of the digestion of OM was in the stomach (Hunter and Siebert, unpublished). When these results are considered in relation to the digestibility values given above, it would seem that when poor quality feeds (<0.55 OMD) are consumed by cattle there is a delay in the passaging of digesta. This in turn increases the time available for microbial attack and finally increases digestibility above that expected.

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