

THE EFFECT OF FERTILIZER AND SUPPLEMENTARY SULPHUR ON  
THE DIGESTION OF DIGITARIA PENTZII IN SHEEP

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Sulphur (S) deficiency in Digitaria decumbens has been shown to reduce the contribution of the rumen to overall digestion (Rees, Minson and Smith, 1974) and alter the proportion of volatile fatty acids in rumen fluid (Rees and Minson, 1978). It is not known whether S fertilizer can change the digestion of protein in the rumen or the flow of non ammonia nitrogen (NAN) from the rumen.

Digitaria pentzii was grown on S deficient soil with (S+) or without (S-) an application of 60 kg S/ha. A seven-week regrowth of each was cut, chopped and dried at 90-100°C. The S- feed contained 0.11% S and the S+ feed 0.17% S but both feeds were similar in N (1.2%), P, K, Ca, Mg, Na, Cu, Zn, cellulose, hemicellulose and lignin content.

Five sheep (group A) were fed S- ad lib. first alone and then with 1 g elemental S/sheep/d. A second group (group B) were fed S- followed by S+ both ad lib. Flow and digestion of organic matter (OM), acid detergent fibre (ADF) and N in the stomach and intestines were measured (Weston 1971). Both supplementary and fertilizer S increased intake of OM but only the increase caused by fertilizer S was significant (see Table). Supplementary and fertilizer S reduced the concentration of rumen ammonia and increased the quantity of NAN leaving the stomach. Fertilizer S increased the digestibility of NAN and quantity of crude protein (CP) digested in the intestines.

Diet	Group A		Group B	
	S-	S- +1 g S/d	S-	S+
OM intake (g/d)	524	571	556	756*
OM digestibility (%)	58.1	53.8	60.4	55.5
ADF intake (g/d)	228	248	242	329*
ADF digestibility (%)	62.7	56.2	63.8	58.1
ADF digestion in stomach (% of total)	86.9	76.0	83.1	82.0
N intake (g/d)	6.2	7.3	6.6	9.9*
Rumen ammonia (mg N/l)	55.3	10.9**	41.8	8.0**
NAN leaving stomach (g/d)	10.2	11.2*	10.2	14.8*
Digestibility of NAN in intestines (%)	55.7	55.6	54.5	66.5**
Intestinally digested CP (g/kg digestible OM)	121	127	104	148**

Significant changes within group; \* P < 0.05, \*\* P < 0.01.

Reduced rumen ammonia levels suggested increased microbial growth in the rumen. There was no evidence however of increased ADF digestion with S+, and thus no explanation for increased OM intake. All diets benefited from the gain of N in the stomach; the balance between intestinally digested protein and OM was substantially better for sheep fed S+.

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