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Effect of sulphur supplementation on intake, digestibility and microbiological changes in the rumen of goats

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The efficacy of sulphur supplementation when ruminants are fed poorly digestible fibrous material is dependent to some extent on the effects upon the ecology of the micro-organisms inhabiting the rumen-reticulum.

Eight male goats were each fitted with a rumen cannula. Over a period of 14 days, the animals were introduced to a diet of corn stubble (84.5 % OM, 5.9 % CP and 206 ppm S), and urea 11 g/d, sodium sulphate 2.5 g/d, and a mineral mix without sulphur as supplement. Considering the sulphur contained in the corn stubble, the nitrogen-sulphur ratio was 16.2 : 1.

Sulphur supplementation caused an increase of 235.3 g/d in the OM intake, and 44 ml/d in water intake. The sulphur improved live weight gains from -52.5 to 12.5 g/d.

The apparent digestibility of OM was also increased by sulphur supplementation from 26.9 % to 37.2 %. The results showed that sulphur fed caused large increases in the DM disappearance of corn stubble from nylon bags in 12, 24, 36 and 48 h.

Sulphur supplementation increased of all three rumen microbial groups, but the most dramatic increase was observed at 24 h in the number of sporangial forms of rumen anaerobic fungi.

The results suggest that sulphur may improve ruminant production by stimulating the activity of rumen micro-organisms, especially those playing a role in degrading fibrous forages with large amount of lignocellulose.

Parameters	Without supplementation		Sulphur supplementation	
DM disappearance from nylon bags (%)				
12 h	16.0	(0.37)	27.5	(1.38)
24 h	21.0	(0.72)	42.9	(0.98)
36 h	28.5	(0.42)	49.1	(1.69)
48 h	39.0	(0.42)	52.2	(1.05)
Rumen anaerobic fungi (sporangia/mm^2)				
24 h	35.0	(5.64)	153.0	(8.87)
48 h	10.0	(2.14)	45.7	(3.97)
Bacteria (x 10^9/ml)	0.2	(0.01)	1.5	(0.11)
Protozoa (x 10^3/ml)	0.5	(0.04)	1.6	(0.15)

Standard error in parentheses.