

NITROGEN TO SULPHUR RATIO IN FEEDS AND FODDERS OF MEHSANA DISTRICT OF GUJARAT

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ABSTRACT

Feed and fodder samples were collected from a village in each taluka of Mehsana district and N:S ratio were estimated. Sulphur content was low in cotton seed cake, lucerne green, millet grain and wheat grain, giving wider N:S ratios (>10:1), while wheat straw, Sagardan (concentrate mixture), millet straw and local grass had narrower N:S ratio (<10:1). It may be inferred that extra sulphur supplementation is necessary for optimum N:S ratios in the diets of ruminants in Mehsana district of Gujarat state.

Key words . Sulphur-Nitrogen ratio, Sulphur containing amino acids.

Optimum N:S ratio (10:1) is necessary for efficient utilisation of nitrogen (Arora *et al.*, 1977) and normal microbial activity in the rumen to synthesize sulphur containing amino acids (Bouchard and Conrad, 1973; Arora *et al.*, 1974) and in consequence to enhance cellulose digestibility (Barton *et al.*, 1971; Bull and Vandersall, 1973). In view of this, a study was conducted to investigate N:S ratios of feeds and fodders in Mehsana district of Gujarat.

Representative samples of feeds and fodders were collected from one randomly selected village in each taluka of Mehsana district. Within the village, with the help of village milk cooperative society, 4-5 farmers, having land in different directions from the village i.e. northern, eastern, western, southern, were identified so as to cover soil types on each side. Feed and fodder samples were collected for analysis of nitrogen and sulphur. Nitrogen contents were estimated by Kjeldhal method. (AOAC, 1980) whereas, sulphur was assessed by turbidity method. The number of samples collected for each feed and fodder is shown in Table 1.

Sulphur contents were unduly low in some of the feeds and fodders and the levels ranging from 0.04 to 0.21 per cent (Table 1). The sulphur content was particularly low in most of the crop residues e.g in straws and stovers (0.10%), the reason being its transfer to seed proteins. Lucerne at green stage was able to pick up sulphur in better quantity from the soil which was around 0.21 per cent. The wide variation in sulphur content of plants depends largely on the amount of sulphur in plant proteins in the form of sulphur containing amino acids (Alloway, 1973; Block *et al.*, 1951; Hume and Bird, 1970; McDowell, 1992;). The concentrats ingredients being fed to livestock in this region have around 0.10 per cent

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sulphur which may not be considered normal (NRC 1989), indicating that its supplementation may be necessary to make up the appropriate N:S ratio in the diet.

Table 1 Nitrogen and sulphur ratio in some feed ingredients collected from Mehsana district (DM basis)

Ingredient	Nitrogen (%)			Sulphur (%)			N:S Ratio
	Range	Mean	SE	Range	Mean	SE	
Cottonseed cake (23)	2.88-4.15	3.47± 0.079		0.09-0.21	0.14±0.005		24.78
Hybrid Napier (4)	0.88-1.41	1.06± 0.110		0.08-0.09	0.09±0.000		11.77
Local grass (15)	0.84-2.01	1.33± 0.088		0.08-0.30	0.15±0.018		8.86
Lucerne (28)	2.53-4.22	3.44± 0.110		0.18-0.30	0.21±0.007		16.38
Millet grain (10)	1.45-2.14	1.68± 0.080		0.09-0.15	0.12±0.006		14.00
Millet husk (6)	0.49-0.85	0.76± 0.056		0.07-0.10	0.09±0.007		8.44
Millet straw (25)	0.49-0.94	0.73± 0.035		0.07-0.09	0.08±0.021		9.12
Sorghum straw (31)	0.28-1.23	0.55± 0.041		0.03-0.06	0.05±0.002		11.00
Wheat grain (6)	1.81-2.10	1.90± 0.060		0.11-0.18	0.13±0.011		14.61
Wheat straw (17)	0.27-0.72	0.54± 0.035		0.06-0.14	0.11±0.005		4.90
Sagardan (24)	2.82-3.89	3.27± 0.063		0.40-4.48	0.43±0.005		7.60

Figures in parentheses indicate no. of samples analysed.

Urea is one of the ingredients of the compound feeds being compounded to meet part of nitrogen requirement in ruminants. It becomes obligatory to supplement sulphur in such diets so as to have suitable microbial activity in the rumen for synthesis of sulphur containing amino acids (Ahuja and Arora, 1982), as well as for the formation of thiamin, biotin and lipoic acid. Thus, with non-protein-nitrogenous diets, additional sulphur is necessary to the extent of 3g per 100g urea with diets containing sulphur less than 0.1 per cent DM. All the synthesized sulphur containing amino acids are utilizable for protein synthesis by rumen microbes for subsequent multiplication and providing protein to the host animal of superior biological value. Wool quality and yield in sheep and goat are also dependent upon adequate sulphur in the diet, the ratio of which to N is 1:5 (S:N).

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