



# A & L CANADA

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## Interactions between Copper, Molybdenum and Sulfur in Ruminant Nutrition

It is well known that alfalfa responds to sulfur fertilization and with a better understanding today of sulfur levels in our soils more and more growers are applying sulfur on alfalfa. The predominant proportion of the organic sulfur is present in the protein fraction (up to 70% of total sulfur), as cysteine and methionine. Cysteine and methionine are highly significant in the structure, conformation and function of protein.

Plant protein contains about 17% N and 1% S. A ratio of these two elements of about 15:1 has been considered adequate to satisfy the nutrition requirements in ruminants. However, narrower N/S ratios have been found desirable because a ratio of 10:1 or slightly less improves utilization of the feed. Common feeds often have N/S ratios considerably wider than 10:1

The addition of fertilizer S decreases the N/S ratio in alfalfa and N/S ratios of 9-13:1 are usually associated with the highest yields of alfalfa and higher production of milk.

When sulfur is applied to soils it makes other nutrients more available except for molybdenum which is reduced when too much sulfur is applied. Alfalfa, being a legume responds favourably to molybdenum. When molybdenum is deficient, caution should be taken when applying it on forages as it ties up copper and many of our soils are already copper deficient. The copper requirement for a 650 kg cow producing 40 litres is approximately 300 mg/day.

Many people are promoting the use of molybdenum which is a good thing where molybdenum is deficient or when using large amounts of sulfur in a fertilization program. However balancing the requirements in forages for S, Mo and Cu should be done by using up to date soil information and plant analysis before molybdenum is applied.

