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Feed material status for flower of sulphur

The Standing Committee on the Food Chain and Animal Health – Section Animal Nutrition discussed the status of flower of sulphur and the outcome of the discussion was summarized as follows in the Minutes of its meeting on 19-20/01/2010:

France reported about its investigation on the case. There was no claim about the objective use of sulphur in the feed. Further enquiry has been launched. No other Member State referred to experiences with the feed use of sulphur. Based on the information available the impression that it would have to be considered a feed additive could not be ruled out. The Commission representative clarified that sulphur is not authorised as a feed additive in the EU. The Committee will come back on the issue.

In the framework of the discussion on the status of “grey zone” products and on invitation of the EU Commission services, FEFAC proposed in July 2009 to clarify that “flower of sulphur” should be clearly identified as a feed material. Herewith additional information that supports this status:

1. Sulphur is an essential macro-mineral

- Sulphur is an essential macromineral for all living organisms, in particular as an essential constituent of amino acids and therefore proteins.
- As any other macromineral (calcium, phosphorous, magnesium, sodium, potassium or chlorine), it is provided to animals either through native presence in feed material and, if necessary, through mineral feed materials, in particular flower of sulphur.
- For dairy cows, NRC and INRA recommend the presence of sulphur in the diet at levels around 2 g/kg DM (i.e. app. 40 g of sulphur for a dairy cow receiving 20 kg DM / day).

2. Flower of sulphur has undoubtedly a nutritional value as source of sulphur and is commonly used across the EU:

- Feed materials provide generally enough sulphur in feed for monogastrics and supplementation through mineral feed materials is not necessary.
- In ruminant feed, sulphur is used by the rumen microflora for synthesis of methionine and cystine. This allows animals to valorize soluble nitrogen from forages which are often poor in sulphur. This is in particular the case for dairy feeding systems based on maize silage (0.7 g/kg DM). It is therefore necessary to bring sulphur in a mineral form, via mineral feed.
- Sulphur can be provided through sulfates (sodium sulfates, trace-element sulfates) but, due to their low sulphur concentration, this must be complemented by more sulphur-rich feed materials, i.e. feed grade flower of sulphur, incorporated in mineral feed at levels between 0.5 and 1%.
- An enquiry among FEFAC Member Associations shows that flower of sulphur is used in many EU member States, in particular those where maize silage represents an important element of ruminant diets.

3. Flower of sulphur is not a feed additive

- Sulphur is not a trace-element and therefore may not be regarded as a feed additive from the trace-element compounds functional group.
- Flower of sulphur has no other purpose than bringing the macromineral sulphur in the diet. Therefore, there is no feed additive functional group under which flower of sulphur could be classified.

Bibliography:

- The following piece is taken from Nutrient Requirements of Dairy Cattle: Seventh Revised Edition, 2001 Subcommittee on Dairy Cattle Nutrition, Committee on Animal Nutrition, National Research Council ISBN: 0-309-51521-1, (2001). Sulphur is covered under macro minerals along with Calcium, Phosphorus, Sodium, Chlorine, Potassium, Magnesium) on page 131

“The dietary requirement of sulfur for the cow is primarily to provide adequate substrate to ensure maximal microbial protein synthesis. In general, the sulfur content of feed-stuffs is directly related to protein concentration. Corn silage is often low in sulfur (0.05 to 0.10 percent) (Hill, 1985) and protein and is the type of diet in which non-protein nitrogen and sulfur can be successfully added to enhance microbial protein synthesis. Non-protein nitrogen, such as urea added to these diets will not be incorporated into microbial protein unless adequate sulfur is present to allow formation of methionine”. “For efficient utilization of non-protein nitrogen, the dietary nitrogen : sulfur ratio should be between 10 and 12:1 (Bouchard and Conrad, 1973b). The sulfur requirement is set at 0.20 percent of dietary DM.”

- List of 13 relevant papers on sulphur and the reasons why sulphur (S) has long been recognized as an essential element for ruminal micro-organisms, and its metabolism is closely related to nitrogen metabolism
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