

SULPHUR TOXICITY IN A GROUP OF LAMBS

G. Baird

SAC Veterinary Science Division, St Boswells, Scotland.

Approximately 200 wether lambs from a hill farm in the Scottish Borders were housed from permanent pasture, with the intention that they be finished on a concentrate diet. From the point of housing all the animals were given *ad lib* access to a proprietary concentrate described as an "intensive lamb pellet".

Nine days after housing neurological signs were noted in several lambs. All affected lambs displayed some degree of depression, varying from dullness to stupor. Several walked aimlessly, while others showed circling behaviour. Lambs were also seen to head-press against walls and to push their heads through the bars of the wooden gates. The worst affected individuals showed a central blindness with total loss of menace reflex.

Following an interim diagnosis of CCN, a mass medication of the group with a multi-vitamin preparation containing vitamin B₁. In addition the worst affected lambs received up to three daily doses of a vitamin B₁ preparation for 2-3 days. Response to treatment was equivocal with the majority of lambs showing no change.

From a total of 40 lambs affected two died and two were euthanased. Gross post mortem examination was unremarkable, but subsequent examination of the animal's brain under an ultraviolet light source revealed areas of green fluorescence within the cerebral cortices. Histopathological examination of the brains demonstrated focal neurodegenerative changes in the cerebral cortex and the frontal brain stem. These changes were consistent with a diagnosis of metabolically induced neurodegeneration, of a type previously associated with high levels of dietary sulphur. Analysis of the concentrate ration confirmed the diagnosis indicating a sulphur content of 6.24 g/kg DM, a level previously associated with toxicity (Jeffrey and others, 1994; Low and others, 1996).

The manufacturers did not dispute the total sulphur content of the concentrate. They indicated that the bulk of sulphur is made up of that within the sulphur containing amino acids methionine and cysteine and the chemical complex FeMoSCa. The latter is specifically included within the concentrate to prevent copper toxicity through the formation of biologically unavailable complexes with molybdenum and sulphur. The manufacturers were aware of the risks associated with sulphur in a ruminant diet. It was however felt that the likely risks from copper toxicity in the UK sheep population were more significant than that from sulphur toxicity.

There are at present no clear guidelines on the critical level of sulphurous compounds in lamb feeds, in relation to the source of sulphur, breed of animal and possible interactions with copper and molybdenum. It is thus suggested that sulphur toxicity should be considered in cases of neurological type disease affecting groups of lambs fed concentrate.

References

- Jeffiey, M., Duff, J.P., Higgins, R.J., Simpson, V.R., Jaclanan, R., Jones, T.O., Mechie, S.C. and Livesey, C.T. (1994). *Veterinary Record*, 134, 343.
- Low, J.C., Scott, P.R., Howie, F., Lewis, J., Fitzsimons, J. and Spence, J.A. (1996). *Veterinary Record*, 138, 327