

## Effect of Sulphur Amino Acids on Epithelial Immunity and Parasite Susceptibility

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**Background** - The sulphur amino acid (SAA), cysteine, which can be synthesised from methionine, is believed to act as a regulatory signal during immune responses to parasitic challenge (Miller *et al.* 2000).

**Objective** – Sheep postruminal SAA supply was manipulated by providing rumen-protected methionine (RPM). The objective was to measure resulting humoral and cell-mediated immune responses and skin hypersensitivity or allergic responses of sheep known to differ in susceptibility to the sheep biting louse, *Bovicola ovis*.

**Design** - The three-month trial was a completely randomised 2 x 2 factorial design (high and low louse-susceptibility x control and RPM diet). RPM diet contained 1.18% SAA, control contained 0.57%. Blood samples were collected fortnightly for white blood cell (WBC) counts, total plasma sulphur and anti-louse antibody titres. Skin hypersensitivity (SH) tests were conducted at the end of the trial.

**Outcomes** - RPM diet raised total plasma sulphur levels by 12%. Low susceptibility sheep had elevated peripheral eosinophils (P=0.04). Sheep fed the RPM diet showed a faster (P=0.05) immediate SH response and RPM fed low susceptibility sheep showed an accelerated (P=0.03) late phase SH response. Anti-louse antibody titres were higher in high susceptibility sheep (P<0.05) at the beginning and end of the trial, with no diet effect.

**Conclusion** - Results suggest that sheep with low susceptibility to lice exhibit an enhanced hypersensitive immune response, whilst highly susceptible sheep exhibit a stronger humoral immune response. They also suggest that SAA supplementation may influence the response time of hypersensitive immunity of sheep to a *B. ovis* challenge.