

## **In Vitro Assessment of True Digestibility and Rumen Parameters of Forage-Based Sheep Diet, Supplemented with Dietary Fossil Shell Flour**

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**Abstract :** The abundance of fossil shell flour (FSF) globally has increased interest in its use as a natural feed additive in livestock diets. Therefore, identifying its optimum inclusion levels in livestock production is essential for animal productivity. This study investigated the effects of various fossil shell flour (FSF) inclusion levels on in vitro digestibility, relative feed values, and rumen parameters of Dohne-Merino wethers. Twenty-four fistulated wethers with an average body weight of  $20 \pm 1.5$  kg in a complete randomized design of four treatments having six wethers per treatment were used. They were fed a basal diet without fossil shell flour (control, 0%) or with the addition of 2% FSF (T2), 4% FSF (T3), and 6% FSF (T4) of diet DM for 35 days, excluding 14 days adaptation period. The results showed that increasing FSF levels had no effect on ruminal TOC or pH, but Ammonia-N increased ( $P < 0.01$ ) with increasing FSF. The total molar concentrations of volatile fatty acids (VFA) decreased ( $P < 0.05$ ) with increasing levels of FSF. Acetic: propionic ratio decreased except at the 4% inclusion level. IVTDMM, IVTDNDF and IVTDADF decreased up till 4% FSF inclusion but tended to increase ( $P = 0.06$ ) at 6% inclusion. Relative feed values of the diets tended to increase ( $P = 0.07$ ) by adding fossil shell flour. In conclusion, adding FSF to the diets of Dohne-Merino wether up to 6% FSF inclusion rates did not improve IVTDMM (In vitro true digestibility dry matter), IVTDNDF (In vitro true digestibility neutral detergent fiber), and IVTDADF (In vitro true digestibility acid detergent fiber). However, a small increment of rumen nitrogen with no adverse effects on the rumen parameters was observed. The relative feed value (RFV) moved the feed from good to premium when supplemented. Therefore, FSF supplementation could improve feed value and maintain a normal range of rumen parameters for the effective functionality of the rumen.

**Keywords :** fossil shell flour, rumen parameters, in vitro digestibility, feed quality, dohne-merino sheep

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