

216. The effect of supplementing ammonia-treated straw with sugar-beet pulp or barley on rumen kinetics and microbial protein production

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Four sheep (body weight 39 to 42 kg) fitted with rumen cannulae were offered ammonia-treated barley straw alone (control) or supplemented with sugar-beet pulp or barley at 200 or 400 g/kg expressed on fresh weight basis (SBP20, SBP40, B20 and B40 respectively) using a 4 × 5 Latin-square design. The effects of the supplements on straw intake, rumen pH, NH_3 , volatile fatty acids (VFA), outflow rate and microbial protein production were examined. Total dry matter intakes were 703, 884, 1049, 848 and 1018 g/day for control, SBP20, SBP40, B20 and B40 respectively ($P < 0.05$). The corresponding intakes of ammonia-treated straw were 703, 709, 580, 678 and 560 g/day. Rumen pH and NH_3 tended to decrease with increasing level of supplementation. VFA concentration was the lowest with the control and highest with SBP40 ($P < 0.05$). Rumen liquid pool size and outflow rate, measured using polyethylene glycol as a marker, were unaffected by the treatments. Microbial protein production, estimated from urinary excretion of purine derivatives, increased significantly ($P < 0.05$) with the level of supplementation (4.31, 6.40, 8.45, 6.79 and 8.94 g N per day for control, SBP20, SBP40, B20 and B40 respectively). The calculated efficiencies of microbial protein production were 19.1, 20.3, 22.6, 22.4 and 22.2 g N per kg digestible organic matter fermented in the rumen (DOMR). Although the control had the lowest value, it did not differ significantly ($P > 0.05$) from the other treatments. It therefore seems that, in the absence of changes in fluid dynamics, the yield of microbial protein per unit DOMR for ammonia-treated straw could not be increased substantially by supplementation with sugar-beet pulp or barley.