

ABSTRACT

THE UTILIZATION OF UREA-TREATED RICE STRAW BY LAMBS

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Two experiments were conducted with the objective of determining the effect of treating rice straw with varying levels of urea on voluntary intake, digestibility and lamb performance. The straw was chopped through a 0.10-cm screen prior to treatment. Treated straws were stored in 244-l metal drums for 30 days before feeding.

In Experiment 1, untreated straw (RS; control diet) and straw treated either with 15g (RS-15), 30g (RS-30) or 45g (RS-45) urea per kg air-dry material were allocated randomly to 16 male lambs (initial Lwt. 22kg) and given ad-libitum for 87 days. The four straw diets were made isonitrogenous by applying a solution of urea. In addition, each lamb received 12g/kg W^{0.75} rice bran per day.

Urea treatment increased the total nitrogen (N) and metabolizable energy (ME) contents of the straw and resulted in a partial reduction in its neutral detergent fibre and hemicellulose contents. Treatment significantly increased the digestibility of dry-matter (DM) ($P < 0.05$), organic-matter (OM) ($P < 0.01$), energy ($P < 0.05$), crude protein (CP) ($P < 0.001$) and cell-wall constituents; the digestibility of hemicellulose was particularly enhance ($P < 0.001$). However, treatment had no

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significant effect on DM intake ($\text{g/kg W}^{0.75}$) but increased both the digestible OM intake and estimated ME intake ($P < 0.05$). Treatment also improved the average daily gain (ADG) ($P < 0.01$), being 0.30g, 0.37g, 0.65g and 0.83g for diets RS, RS-15, RS-30 and RS-45, respectively. Corresponding values for feed conversion efficiency (FCE) ratios were 20, 26, 14 and 12 ($P < 0.01$).

In Experiment 2, straw was treated either with 40g (RS-40), 60g (RS-60) or 80g (RS-80) urea per kg air-dry material. The straw was randomly allocated to 18 male lambs (initial Lwt. 29kg) and given ad-libitum in addition to rice bran ($12\text{g/kg W}^{0.75}$ per head per day) for 87 days.

There were no major differences in straw chemical composition except for an increase in N content with increase in urea treatment levels. Except for CP, the digestibility of DM, OM, energy, cellulose and hemicellulose did not differ significantly ($P > 0.05$) among diets and neither were differences in DM intake, ADG and FCE ratios significant ($P > 0.05$).

Under the conditions of this study, optimum responses in nutrient utilization and lamb performance appeared to occur at urea levels of between 30 and 45g/kg air-dry straw. The results of the two experiments demonstrate that urea has considerable potential for improving the nutritive value of rice straw. For efficient utilization of treated straw, it is recommended that appropriate regime of supplementation be established.