

## **Investigating the effects of slow-release urea and molasses on histomorphometric tissue of rumen and abomasum and rumen fermentation parameters of fattening lamb**

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### **Abstract**

This study aimed to investigate the effects of slow-release urea in comparison with conventional urea, with or without the addition of molasses, on rumen fermentation, histomorphometrically and cellular parameters of rumen and abomasum of growing lambs. The experiment was conducted in a completely randomized design with 5 treatments including control, two sources of non-protein nitrogen (1.6% conventional urea and 1.8% slow-release urea) with or without molasses (0% and 20%) and 7 replicates with using of 35 Arabian lambs during 105 days. The diets included 70% concentrate and 30% forage. Using slow-release urea reduced the concentration of acetate. Adding molasses to the ration increased the concentration of butyrate and total rumen volatile fatty acids relative to the control diet. In control, rumen pH was lower than non-protein nitrogen sources. Compared to conventional urea, using slow-release urea with or without molasses in the diet increased stomach glands depth and decreased thickness of tunica submucosa, and also tunica vascularizes. The addition of molasses was increased epithelial cell height and decreased numbers of parietal cells and chief cells in the abomasum. At the cellular level, the addition of molasses had damaging effects on epithelial cells, and increased diffuse lymphatic tissue was observed. In general, there was no significant difference between non-protein nitrogen sources on gastrointestinal tissue. Because of the undesirable effects of using a high level of molasses on the tissue structure of the digestive tract, the inclusion of 20% ration dry matter molasses in a high concentrate diet is not recommended.

**Key words:** Slow Release Urea, Molasses, Volatile Fatty Acid, Histomorphometry, Rumen and Abomasum

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