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Utilization of corn gluten feed as an additive to improve quality and nutritive value of maize silage

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Abstract

This research was conducted to study the effect of corn gluten feed (CGF), as an additive, on the silage characteristics of maize forage and to determine the feed intake and digestibility of the treated silage in sheep nutrition. Whole plant maize harvested with chopper and divided into three parts, where one part ensiled without additive and the other two parts were ensiled with 5 and 10 percent CGF respectively, using 15 200L polyethylene barrels. After three months of ensiling, silos were opened and sampled for chemical analysis and measurement of silage characteristics. Additionally, voluntary intake and digestibility of the silages were determined in sheep nutrition along with basal diet (Alfalfa hay+wheat straw+barley ground), using six animals per diet. Results showed that addition of CGF increased dry matter (DM) from 19.16 to 25.04 and crude protein (CP) from 8.22 to 11.53 percent ($p<0.05$) in the silages, but pH and organic matter content were not affected by the treatments. Neutral detergent fibre (NDF) was increased but acid detergent fibre was decreased by ($p<0.05$) addition of CGF to the silages. In company with the increasing CP, non-protein nitrogen ratio was also increased in the treated silages ($p<0.05$). In spite of valeric acid that was reduced in 10% CGF silage other short chain fatty acids (butyric, isobutyric and propionic) were not affected by the treatments. Results of the feeding trial showed that the DM intake and digestibility were increased when the animals fed CGF treated silages ($p<0.05$), resulted in a higher digestible DM, OM and NDF intake. Finally, it is concluded that addition of CGF could have positive effect on the quality of maize silage with improvement of the digestibility and voluntary intake in sheep.

Keywords: Corn gluten feed, maize, nutritive value