26. USE OF FRESH SUGAR CANE CRUSH AS AN ADDITIVE FOR GRASS SILAGE

Kavana, P.Y., MSc. (Agric.) (1998)

Supervisors: Dr. E. J. Mtengeti and Prof. N. A. Urio

A study comprising two experiments was conducted to investigate the effectiveness of Fresh Sugar Cane Crush (FSCC) as water soluble carbohydrate (WSC) additive for napier (*Pennisetum purpureum*) and guatemala (*Tripsacum laxum*) grasses silage making. Polyvinyl chloride (PVC) pipes of average 1.9 X 10^2M^3 were used as laboratory silos for experiment I and earth pit silos (7.5 x 10^2M^3) for experiment II. The second experiment was conducted so as to mimic the field condition as well as to produce enough silage for acceptability test by dairy heifers. The effect of grass species and additives were observed in both experiments while the effect of wilting was observed in the first experiment only. In both experiments five experiments comprised of T1 - no additive (control), T2 - 5% molasses, T3 - 5% FSCC, T4 - 10% FSCC, T5 - 15% FSCC were used to test the effectiveness of FSCC as a WSC additive in grass silage making. Parameters observed were chemical composition, fermentation products, sensoric tests and *in-vitro* dry matter digestibility (IVDMD). Dry matter losses and acceptability test were observed in the second experiment. The data were analysed by general linear model system of SAS (1988). In the experiment, there were no significant ($P>0.05$) difference between unwilted and wilted napier silages in terms of DM contents. Wilted guatemala silage had significantly ($P<0.05$) higher DM contents than unwilted guatemala silage. In napier silage, wilting resulted into higher WSC (16.7 Vs 15.0 gkg^{-1}DM), IVDMD (59.9 vs 58 7%). pH (402 vs 3.89), ammonia nitrogen (3.4 vs 2.5%) and lower lactic acid (15.3 vs 17.5 gkg^{-1}DM). In guatemala grass silage, wilting resulted into higher WSC (20.4 vs 14.2 gkg^{-1}DM), ammonia nitrogen (3.8 Vs 2.9%), lactic acid (18.4 Vs 13.5 gkg^{-1}DM), butyric acid (1.2 Vs 0.6 gkg^{-1}DM) and lower IVDMD (60.7 Vs 62.2). The pH between wilted and unwilted guatemala grass silage were not significantly different ($P>0.05$). The DM contents were significantly different ($P<0.05$) between treatments in unwilted napier and wilted guatemala grass silages. For both napier and guatemala grass silages, pH ranged from 3.78 in T5 for unwilted

guatemala to 4.5 in T1 for wilted napier. Lactic acid ranged from 3.6 in T1 wilted guatemala to 27.4 gkg^{-1}DM in in T5 unwilted napier. Ammonia nitrogen was lowest (2.3%) in T1 wilted guatemala. Regardless of wilting DM, WSC, IVDMD, ammonia nitrogen, and butyric acid were significantly ($P<0.05$) higher in guatemala silage than in napier silage.The pH and lactic acid contents of napier and guatemala silages were not significantly ($P>0.05$) different. In experiment two, the DM contents were significantly ($P<0.001$) different between treatments in guatemala silage and the percentage DM loss ranged from 16.1 in T5 to 39.1 % in T1. In napier silage the DM loss was highest (32.9%) in T2 and lowest (13.7%) in T3. In guatemala silage the intake rate between treatments ranged from 14.6 in T4 to 31.2 gDM/min in T2. In napier silage the intake rate ranged from 29.1 in T2 to 41.6 gDM/min in T4. Both napier and guatemala silages showed significant (($P<0.05$) difference between treatments in terms of WSC and IVDMD. In napier silage, the control treatment had highest pH (4.34), ammonia nitrogen (3.9%) and lower lactic acid (7.9 gkg^{-1} DM). Butyric acid was not detected in napier silages. In guatemala silage, the control treatement showed the highest pH (4.54), Ammonia nitrogen (3.1 %), butyric acid (3.0gkg^{-1} DM) and lowest lactic acid (7.3 gkg^{-1} DM). There wee no significant differences between napier and guatemala silages in terms of DM, IVDMD and ammonia nitrogen. The WSC contents and intake rate were higher in napier than in guatemala silage. The percentage DM loss, pH, lactic acid and acetic acid content were significantly (P(0.05) higher in guatemala that in napier silage. It was concluded that 5% FSCC and 10% FSCC could be used to conserve well silages of guatemala and napier grasses, respectively. Further findings are required to establish the levels of inclusion of FSCC in other common grasses such as *Panicum maximum* and *Setaria splendida.*