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THE NUTRITIVE CHARACTERISTICS OF MAIZE SILAGE
AND MAIZE SILAGE/GRASS RATIONS FOR CATTLE

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ABSTRACT

An experiment was conducted to investigate some of the nutritional properties of maize silage, when fed to rising two year old monozygous twin Jersey and Jersey cross cattle, housed indoors.

In a preliminary experiment, silages made from maize harvested with two types of harvester were evaluated in terms of digestibility, rate of passage, and the extent of kernel loss in the faeces. Fine chop (conventional) silage (mean particle size 1.24 cm) and coarse chop silage (2.20 cm) were each fed to six animals at restricted levels of intake. The mean retention times of the fine (44.6 hours) and coarse (49.0 hours) chop silages were significantly different ($P < 0.01$) but differences between DM digestibilities (62.7 and 65.1% respectively) were not significant. Undigested faecal kernel loss from both silages was negligible. Intakes of the fine chop silage were slightly higher than those of the coarse chop, but this may have been due to its higher dry matter content.

In the main experiment maize silage and grass (ryegrass/clover (MP), and Tama (Ta) in separate trials), in the ratios of 100:0 (t_1), 80:20 (t_2), 45:55 (t_3) and 0:100 (t_4), were fed ad lib to four groups of four cattle. The experimental layout was a balanced incomplete block design, and the main parameters measured were digestibility and voluntary intake. Digestibilities rose as the proportion of grass in the rations increased. Approximate OM digestibilities for t_2 , t_3 and t_4 were 68.0, 73.0 and 82.0% respectively, however silage (t_1) digestibilities were low, and declined from 65.4 to 57.2% over the duration of the experiment (8 weeks). In most instances, comparisons between t_3 (or t_4) and t_1 were highly significant ($P < 0.01$). Voluntary intakes of cattle fed the mixed rations were significantly greater than those of animals fed silage ($P < 0.05$) or grass alone, and responses to the t_3 ration were greatest when the Tama was used. When Tama was offered the DM intakes (g/kg BW^{0.75}) for t_1 , t_2 , t_3 and t_4 were 95.9, 107.0, 122.3 and 88.9, respectively, and when MP was fed corresponding values were 84.3, 102.1, 108.8 and 101.6. Digestible DM intakes (g/kg BW^{0.75}) of the cattle fed silage (51.7) were 27% below those of the cattle fed grass alone (66.5 for both grasses). Intakes of t_2 (64.8 (MP), 68.4 (Ta)) were similar to those of t_4 , whereas t_3 resulted in much higher intakes, particularly when Tama was fed (70.8 (MP), 80.7 (Ta)). All comparisons between t_1 and the mixed rations were highly significant ($P < 0.01$) and the $t_1 - t_4$ comparisons were significant at $P < 0.025$.

The results were discussed, and it was concluded that small amounts of fresh pasture can overcome the protein deficiencies of maize silage, and lead to intakes of digestible DM which are similar to those of cattle fed grass alone. Higher levels of grass supplementation resulted in very high intakes.

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