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P158 Grass forage quality and digestion kinetics as influenced by maturity and N fertilization.

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Objectives were to access the influence of N fertilization (0, 54, 71, 107, and 214 kg of N/ha) and maturity of first cut reed canarygrass {Phalaris arundinacea L.) and timothy (Phleum praicnse L.) on fiber and nitrogen partitioning, and on digestion kinetics. On May 26 and June 6, 1994, four replicates were harvested. Delaying harvesting from May 26 to June 6, 1994 increased {P < .05) NDF (56 to 63%), ADF (28 to 33%). permanganate lignin (2.9 to 4.5%), ND insoluble protein (21 to 25% of CP), and AD insoluble protein (2.3 to 4.0% of CP) and decreased (P < .05) CP (18 to 13%). A quadratic response {P < .05) to N fertilization for NDF was observed (NDF = 58, 63. 62, 60.1, and 56%, respectively for 0. 54, 71, 107, and 214 kg of N/ha). Similar responses were observed for ADF and lignin. The CP concentration increased (P < .05) with increasing N fertilization (9.9 to 21.7% for 0 and 214 kg of N/ha. respectively), while increasing N fenilization from 0 to 214 kg of N/ha deceased {P < .05) ND insoluble protein (26.8 to 18.0% of CP) and AD insoluble protein (4.4 to 2.0% of CP). These results indicate that most of the increase in CP was as soluble CP. Grass fertilized with 214 kg of N/ha, averaged across maturities, had higher rates of in vitro fiber digestion (.09 + .04 h'") compared to grass receiving no N fertilizer (.05 ± .01 h''). Fertilization with N alters protein composition, fiber composition, and digestion kinetics, in addition to CP content.

Pi69 "'fiuence of grass protein fractions on estimated allowable milk. J.S. Jonker*,

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The Cornell Net Carbohydrate and Protein System Model (CNCPS) can be used to show the effects of variability in protein fractions on allowable milk. Our objective was to use ihe CNCPS to evaluate the sensitivity of milk production to variation in feed protein fractions; soluble intake protein (SIP). ADIN, ND insoluble nitrogen (NDIN) and protein degradation rates (BI, B2, B3) for normal ranges in grass hay (GH) and grass silage (GS) Ranges used were based on one SD intervals around averages value of protein fractions as determined by the Northeast Dairy Herd Improvement Association Forage Lab. The ranges for GH were CP 10 5+3 1% (n=3074) SIP 31+6.4% of CP (n=2125), ADIN 1.1+0.4% (n=82). and NDIN 3.0+1.06 (n=20). Ranges for GS were CP 13.8+3 6 (n=2304). SIP 48.6+11.8% of CP (n-1957). ADIN 1.7+0.6% (n=2304). and NDIN 4.06+1.76% (n=50) The CNCPS estimates were based on standard CNCPS feed libra^- values for an all orchardgrass (early bloom, NDF=57%, lignin=7.7% of NDF) ration for a 590 kg lactating Holstein cow at three CP levels (8.2%, 12.2%! 16.2%). Estimated allowable milk production was based on Metabolizable Protein (MP). When SIP was increased 10% (one SD; 45 to 55%). MP milk decreased 10%. One SD increase in ADIN resulted also in a 10% decrease in MP milk One SD increase in NDIN increased MP milk 25%. No Change in MP milk occurred for BI and B3 protein degradation rates. As the 82 protein degradation rate increased, a curvilinear decrease in MP milk was observed The MP milk was most sensitive to NDIN and the B2 protein degradation rate, but the small vanation m 82 rates allowed only a small change in MP milk. However, the B2 rate is derived from the BI and 83 rates. The CNCPS results demonstrate the need for accurate evaluation of protein fractions and degradation rates of grass.

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