297 Evaluation of neutral detergent fiber, acid detergent fiber, and acid detergent insoluble ash to predict forage selection among heifers grazing pastures containing a binary mixture of brassicas and grass. B. R. Brunsvig*, A. J. Smart, and D. W. Brake, *South Dakota State University, Brookings.*

Diet selection is impacted by a myriad of factors among grazing cattle. A greater understanding of diet selection can allow improved estimates of performance, digestion, and nutrient balance. However, few data are available related to diet selection by cattle grazing cool-season annual forages. Often, estimates of diet selection among cattle grazing mixed pastures require complex laboratory analyses and can be variable. However, innate markers (e.g., NDF, ADF, acid detergent insoluble ash [ADIA]) may allow for prediction of diet selection in cattle grazing pastures that contain limited amounts of plant species. Diet samples were collected from ruminally cannulated heifers grazing a binary mixture of annual ryegrass (*Lolium perenne*) and brassica (*Raphinus sativus*, forage radish, and *Brassica rapa*, purple top turnip) at 3 stocking rates (1.7, 2.3, and 2.9 AUM/ha). Forage samples were clipped 11 d prior to grazing, and masticate was collected 2, 24, and 46 d after cattle began grazing pastures. Subsequently, forage samples and masticate were analyzed for NDF, ADF, and ADIA. Estimates of brassica or grass intake did not differ in response to increased stocking rate when intake was estimated with NDF ($P \geq 0.52$), ADF ($P \geq 0.48$), or ADIA ($P \geq 0.34$). However, intake predictions using NDF and ADIA resulted in differences in time (quadratic, $P < 0.01$) but ADF did not ($P \geq 0.61$). Interestingly, estimates of brassica and grass intake were 52% greater and 32% less when predicted using ADF in comparison with NDF. Similarly, estimates of brassica and grass intake using ADF were 35% greater and 38% less in comparison with ADIA. The overall pooled coefficient of variation for estimates of grass and brassica intake was 55, 60, and 65% for NDF, ADF, and ADIA, respectively. It seems logical that NDF may allow for improved estimates of brassica and grass intake because true fiber has no potential for contamination by endogenous sources. Improvement among nondestructive technologies that allow rapid analysis of samples (e.g., near-infrared reflectance spectroscopy) may allow further improvements in estimates of diet selection among cattle grazing binary mixtures of annual forages.

Key Words: cattle, diet selection, forage
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298 Greenhouse gas emissions from an intensive grassland: Key driving variables. A. C. Ruggieri*[1,2], D. J. A. Santos[3], E. R. Janusckiewicz[3], L. F. Brito[3], E. S. Morgado[4], R. A. Reis[5], and A. S. Cardoso[3], [1]*University of Sao Paulo State, Jaboticabal, Brazil,* [2]*CNPq, Brasília, Brazil,* [3]*Sao Paulo State University, Jaboticabal, Brazil,* [4]*Universidade Federal de Uberlandia, Uberlandia, Brazil,* [5]*São Paulo State University (UNESP) School of Agricultural and Veterinarian Sciences, Jaboticabal, Brazil.*

Since the industrial revolution, the temperature of the Earth's atmosphere has been increasing, leading to observed global warming. Increases in the greenhouse gases (GHG) concentration in the atmosphere, such as carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O), are appointed to be responsible for these changes. In a livestock system based on grassland, a large amount of these gases can be emitted. A few quantifications of these GHG emissions and key drivers controlling their production were carried out. This research aimed to evaluate the key variables driving involved in the GHG emissions from a tropical soil cultivated with grass. The experiment was performed at São Paulo State University during 3 yr (2012–2014). The GHG emissions were measured using static closed chamber methodology and quantification by gas chromatography. To identify the key variables explaining the GHG fluxes, a principal component analysis was run. The variables analyzed were pasture height, precipitation, soil moisture, soil ammonium, soil nitrate, and the GHG fluxes. Two principal components, precipitation and pasture height, explained 44.74% of the cumulative variance. Within components for CO_2 fluxes, a significant correlation was found with pasture height (0.57; $P < 0.001$) and soil moisture (0.36; $P < 0.01$). For CH_4 emissions, a strong correlation was found with precipitation (−0.80; $P < 0.001$) followed with CO_2, whereas N_2O fluxes was correlated with precipitation (0.48; $P < 0.001$) and soil ammonium (0.36; $P < 0.05$). The GHG fluxes may have been explained by the moisture, which is an important issue for microorganism life and chemical reactions of the carbon and nitrogen cycles. Pasture height possibly explained the CO_2 fluxes because of the leaf area variation among the pastures, which influences the photosynthesis. Methane emissions could be associated with CO_2 fluxes because in certain conditions, this gas is oxidized and produces CH_4. The key driving variables involved in the GHG emissions were soil moisture and pasture height, precipitation and CO_2 fluxes, and precipitation and soil ammonium for CO_2, CH_4, and N_2O, respectively.

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