

- 767 Automated total collection and indicator methods for estimating digesta flow in steers fed roughage or concentrate. R. C. Wanderley*, C. E. Theurer, T. H. Noon and S. Rahnama. University of Arizona, Tucson.

Automated total collection (ATC) of digesta from two steers fitted with re-entrant duodenal cannulas was compared with flow estimations based on chromium oxide concentrations of ATC samples. Each steer (avg. weight, 300 kg) was fed about 4 kg daily of an all-roughage and an 80% sorghum grain diet. Animals were adjusted to the collection crate and apparatus for 3 to 5 days before each 3 to 6 day collection. Sample aliquots were pooled every 2 hr within each 24 hr collection period. Chromium oxide overestimated digesta flow as compared to ATC by 12 to 45%. Mean daily flow rates (liters) based on ATC and chromium oxide for the grain diet were (mean $\pm$ SD) 42 ± 5 and 47 ± 7 , respectively. Similar values for the all-roughage diet were 64 ± 13 and 91 ± 19 . Mean recovery of chromium oxide at the duodenum was 90% and 74% for the grain and roughage diets, respectively. Two-hour flow varied markedly among days within diets, with coefficients of variation (CV) ranging from 8 to 86%. Mean CV's (among days) for grain and roughage diets were 30 and 37% respectively. Digesta flow pooled every 2 hr within days showed a marked diurnal variation with both diets. Mean CV's (within days) for grain and roughage diets were 29 and 38%, respectively. For the grain diet, diurnal flow rate showed a quartic pattern ($P < .05$); however, the R^2 value was only .21. No consistent digesta flow pattern could be identified with the roughage diet. The data suggest that special emphasis should be given to the problem of accurately sampling duodenal contents when using indicators to estimate digesta flow.

KEY WORDS: automated digesta collection, flow markers, chromium oxide, beef cattle

- 768 Evidence for genetic differences in digestive capacity and fasting heat production among inbred lines of cattle. T. C. Wedegaertner*, D. E. Johnson, J. C. Brinks, W. C. Wilcox, Colorado State University, Fort Collins.

Expt. 1: Four 7-day conventional balance trial measurements of nutrient digestibility and 9-24 hr indirect respiration calorimetry measurements of heat and methane production were made on each of three inbred Hereford (Brae Arden) and three inbred Red Angus (Choctaw) X Hereford cross steers while consuming two levels of an 90% concentrate diet. Animal weight (300 kg.) was similar ($P > .1$) between groups. Choctaw steers digested 76.4 and 75.0% of their diets dry matter and energy which was greater ($P < .01$) than the 72.8 and 71.6% dry matter and energy digestibility observed with the Brae Arden steers. Choctaw steers digested 65.6 and 92.0% of their nitrogen and starch intake whereas the Brae Arden steers digested less (61.8 and 87.6%) of both nitrogen and starch ($P < .01$). Choctaw steers retained 3.57 g/day less nitrogen ($P < .05$) than the Brae Arden steers. Retained energy (RE) from metabolizable energy (ME) intake as $\text{kcal}/\text{kg}^{.75}$ was: RE = .666 ME - 77.5 ($r^2 = .98$) for the Choctaw group and RE = .635 ME - 70.94 ($r^2 = .99$) for the Brae Arden group. Maintenance energy requirements averaged 116.4 and 111.7 $\text{kcal ME}/\text{kg}^{.75}/\text{day}$ for the Choctaw and Brae Arden groups respectively. Expt. II: Duplicate fasting heat production measurements were determined. These averaged 89.56 and 82.5 $\text{kcal}/\text{kg}^{.75}/\text{day}$ for the Choctaw and Brae Arden groups respectively. Expt. III: Four Choctaws and two Brae Ardens were used in another experiment similar to Expt. I when they averaged 407 kg liveweight. The Choctaw group digested more ($P < .05$) dry matter than did the Brae Arden group (77.7% vs. 75.7%). The possibility of genetically controlled digestive capacity variance among inbred lines of cattle is noteworthy.

KEY WORDS: Inbred cattle, Digestibility, Fasting heat production

- 769 Fecal Indices: Relationship between Fecal Components and Green Forage Digestibility and Intake. G. R. Wehner*, J. W. Holloway and W. T. Butts, Jr., University of Tennessee, Knoxville.

Thirty-eight in vivo digestion (dig.) determinations with 3 yr. old, spring-calving cows were made on fresh red clover, orchardgrass-white clover, fescue and fescue-legume forages each at four stages of maturity to obtain an array of dig. Composite fecal samples were analyzed for dry matter (DM), N, ether extract (EE), crude fiber (CF), ash, cell wall constituents (CWC), acid insoluble ash (AIA), Na, Zn, Mg, Ca, K, Fe, Mn, P, Ca, density, in vitro dig. (IVDMD and IVOMD). N of CF, Van Soest fiber fractions (CWCF, ADFN, ADLN) and