

M359 Digestion and rumen fermentation in precision-fed dairy heifers on low or high forage rations at four levels of dry distillers grain. F. X. Suarez-Mena*, G. J. Lascano, and A. J. Heinrichs, *The Pennsylvania State University, University Park.*

The objective of this study was to determine the effects of forage to concentrate ratio (F:C) and corn dry distillers grain with solubles (DDGS) at various inclusion levels in precision-fed dairy heifer diets on digestion and rumen fermentation. A split plot design with F:C as whole plot and DDGS inclusion level as sub-plot was administered in a 4-period (19 d) 4×4 Latin square. Eight ruminally cannulated Holstein heifers (344 ± 15 kg BW) housed in individual stalls were allocated to 2 F:C (50:50 LF or 75:25 HF; DM basis) and to a sequence of DDGS inclusion (0, 7, 14 and 21%; DM basis). Diets were fed to provide equal amounts of nutrients allowing 800 g/d BW gain and fed 1X/d. Ruminal contents were sampled at -2, 0, 2, 4, 6, 8, 10, 12, and 20 h after feeding. Statistical analysis was conducted using the MIXED procedure of SAS. LF rations had greater apparent digestibility (AD) of DM (66.7 vs. $63.2 \pm 0.8\%$; $P = 0.02$) and OM (69.0 vs. $65.2 \pm 0.6\%$; $P < 0.01$). AD responded quadratically for DM, OM, ADF and NDF with 14% DDGS inclusion level having the highest values. Rumen concentration of ammonia tended to be higher for HF (7.68 vs. 6.48 ± 0.44 mg/dL; $P = 0.07$) and tended to increase as DDGS increased (6.46 to 8.14 ± 0.62 mg/dL; $P = 0.08$). Molar proportions (% of total VFA) of acetate tended to be greater for HF (65.8 vs. $64.0 \pm 0.6\%$; $P = 0.07$) and decreased as DDGS increased (65.4 to $63.9 \pm 0.5\%$; $P < 0.01$); propionate increased as DDGS increased (18.8 to $20.6 \pm 0.3\%$; $P < 0.01$). Acetate to propionate ratio decreased as DDGS increased (3.49 to 3.11 ± 0.06 ; $P < 0.01$). Rumen protozoa count decreased as DDGS increased (24.42 to $11.94 \pm 3.15 \times 10^4$ /mL; $P < 0.01$). We conclude that nutrient AD had a greater response when included at 14% DDGS. Ammonia concentration and molar proportion of propionate increased; while molar concentration of acetate, acetate to propionate ratio, and rumen protozoa number decreased with increasing levels of DDGS. LF rations had greater DM and OM AD.

Key words: digestion, dry distillers grain with solubles, fermentation