PSIV-4 Effects of Passage Rate on Rumen Microbial Composition. Sara M. Tondini1, Gabe Jennings2, Angela R. Green-Miller1, Daniel W. Shike1, Darren D. Henry4, Joshua C. McCann1, 1University of Illinois at Urbana-Champaign, 2R. A. Brown Ranch, 3University of Illinois, 4University of Georgia

Abstract: The objective was to evaluate the effects of dietary treatments designed to increase passage rate on the rumen microbiome. Factors such as particle size, feedstuff degradability, and rumen motility may drive ruminal passage rates and alter the composition of rumen microorganisms responsible for methane formation. Eight ruminal-cannulated steers were assigned to a replicated 4 × 4 Latin square design. All steers were fed an ad libitum diet of prairie grass hay (10.4% crude protein) with treatments designed to increase passage rate: no treatment (CON), pelleted (PEL), 7% Ca(OH)2 treated (ALK), and six 2 kg weights inserted into the rumen (WTS). Ruminal contents were collected on d 13 for 16S rRNA sequencing using specific bacterial and archaeal primers. Bacterial and archaeal taxa were not different (P > 0.1) between WTS and CON. At the genus level, PEL-fed steers had decreased (P = 0.01) relative abundance of Butyribrio 2 when compared with CON. Steers fed ALK had decreased (P < 0.01) relative abundance of Rikenellaceae RC9 gut group but increased (P < 0.01) Christensenellaceae R-7 group compared with CON. In contrast, relative abundance of Christensenellaceae R-7 group decreased (P = 0.03) in steers fed ALK compared with CON. The most abundant archaea, Methanobrevibacter, increased (P = 0.04) in steers fed ALK compared with CON (75 vs 65% of archaeal reads, respectively). Additionally, relative abundance of Methanosphaera increased (P < 0.01) in steers fed PEL compared with CON. Measures of richness including Chao1 and observational taxonomic units were decreased (P < 0.01) in ALK-treated steers but were not affected (P > 0.2) by PEL or WTS compared with CON. In conclusion, pelleting and alkali treatment of hay affected the rumen microbiome composition compared with steers fed basal prairie grass hay. Increased passage rates may alter composition of rumen bacteria and archaea communities.

Keywords: methanogen, passage rate, rumen microbiome

PSIV-5 Effects of Soybean Meal Addition to Increase Crude Protein in Growing Easycare Lamb Diets. Skyler S. Scotten1, Payton L. Dahmer1, Cassandra K. Jones1, 1Kansas State University

Abstract: A common industry practice is to substitute soybean meal (SBM) in place of corn for growing lambs in a feedlot setting, but there is limited data evaluating its impact, especially in hybrid hair sheep. The objective of this experiment was to evaluate the effect of increasing levels of crude protein (CP) by substituting SBM place of corn in growing Easycare lambs. A total of 77 Easycare (Dorper × Katahdin × Romanov) lambs were utilized in a completely randomized design with 7 replicate pens per treatment. Lambs (33 females; 26.3 ± 0.99 kg and 44 castrated males; 27.2 ± 0.95 kg) were fed for 28 d. The three dietary treatments included 1) Control (basal diet; 7.7% SBM and 11.0% CP); 2) SBM4 (4% SBM replacing corn in the basal diet; 11.7% SBM and 12.8% CP); and 3) SBM8 (8% SBM replacing corn in the basal diet; 15.7% SBM and 14.8% CP). Average daily gain (ADG), average daily feed intake (ADFI), gain to feed (G:F), and income over feed costs were determined. At the conclusion of the study, 15 castrated males were harvested to evaluate dietary impact on carcass characteristics. Data were analyzed using the GLIMMIX procedure of SAS v9.4 (SAS Inst., Cary, NC). Castrated males fed the control diet had reduced (P < 0.05; 0.20 kg/d) ADG compared with those fed SBM4 or SBM8 (0.29 and 0.32 kg/d, respectively) or ewes consuming any diet (0.29 kg/d for all treatments). However, there was no evidence (P > 0.05) that dietary treatment impacted final body weight, ADFI, G:F, income over feed cost, or measured carcass characteristics. These results suggest that growing Easycare castrated males benefit from 4% added SBM in place of corn to increase dietary CP, and that additional research is warranted to evaluate longer-term impacts on cost and carcass impacts.

Keywords: crude protein, Easycare sheep, soybean meal