

## Forages and Pastures III

**597 Performance by spring and fall-calving cows grazing with full access, limited access, or no access to endophyte-infected tall fescue.** J. Caldwell\*<sup>1</sup>, K. Coffey<sup>1</sup>, D. Philipp<sup>1</sup>, J. Jennings<sup>3</sup>, D. Hubbell, III<sup>1</sup>, T. Hess<sup>1</sup>, D. Kreider<sup>1</sup>, M. Looper<sup>2</sup>, M. Popp<sup>1</sup>, M. Savin<sup>1</sup>, and C. Rosenkrans, Jr.<sup>1</sup>, <sup>1</sup>University of Arkansas, Fayetteville, <sup>2</sup>USDA-ARS, Booneville, AR, <sup>3</sup>Cooperative Extension Service, Little Rock, AR.

Although performance by cows is improved greatly when toxic *Neotyphodium coenophialum*-infected tall fescue (E+) is replaced with a non-toxic endophyte-infected fescue (NE+), acceptance of NE+ by producers has been slow. Our objective was to compare performance by spring (S) and fall-calving (F) cows grazing either E+ or NE+ at different percentages of the total pasture area to determine to what extent having limited access to NE+ will enhance cow BW and BCS and calf weaning weights. Gelbvieh by Angus crossbred cows (n=144) were stratified by weight and age within calving season and allocated randomly to 1 of 14 groups representing 5 treatments: 1) F on 100% E+ (F100); 2) S on 100% E+ (S100); 3) F on 75% E+ and 25% NE+ (F75); 4) S on 75% E+ and 25% NE+ (S75); and 5) S on 100% NE+ (NE100; 2 replications). Cow BW and BCS at breeding and BCS at weaning were greater (P<0.05) for F vs. S. Cow BCS at breeding and BW at weaning were greater (P<0.05) for NE100 vs. S75, and cow BCS at weaning was higher (P<0.05) for the mean of F75 and S75 vs. that of F100 and S100. Calf gain, actual and adjusted weaning weight, ADG, and calf value at weaning were higher (P<0.05) from F vs. S. When compared with S75, NE100 calves tended (P<0.10) to have higher actual and adjusted weaning weight, ADG, and calf value, and had higher (P<0.05) preweaning gain. Weaning age did not differ (P>0.19) among treatments. Therefore, a fall calving season may be more desirable for cows grazing E+ pastures, resulting in better BW and BCS at critical times as well as heavier calves with higher value at weaning. Limited use of NE+ during the grazing season may improve cow BW at later stages of lactation. This project was supported by the National Research Initiative of the Cooperative State Research, Education and Extension Service, USDA, grant # 2006-55618-17114.

**Key Words:** Tall Fescue, Novel Endophyte, Cows

**598 Warm-season legume haylage or soybean meal supplementation effects on the performance of lambs.** J. L. Foster\*<sup>1</sup>, A. T. Adesogan<sup>1</sup>, J. N. Carter<sup>1</sup>, L. E. Sollenberger<sup>1</sup>, A. R. Blount<sup>1</sup>, R. O. Myer<sup>1</sup>, S. C. Phatak<sup>2</sup>, S. C. Kim<sup>1</sup>, T. Kang<sup>1</sup>, M. Brew<sup>1</sup>, and K. G. Arriola<sup>1</sup>, <sup>1</sup>University of Florida, Gainesville, <sup>2</sup>University of Georgia, Athens.

This study determined how supplementing bahiagrass haylage (BGH, *Paspalum notatum*) with soybean (*Glycine max*) meal (SBM) or warm-season legume haylages affected the performance of lambs. Forty-two Dorper x Katadhin lambs (27.5 ± 5 kg) were fed *ad libitum* BGH (67.8% NDF, 8.9% CP) alone, or supplemented with SBM (18.8% NDF, 51.4% CP) or haylages of annual peanut (*Arachis hypogaea*; 39.6% NDF, 17.1% CP), cowpea (*Vigna unguiculata*; 44.1% NDF, 14.6% CP), perennial peanut (*Arachis glabrata*; 40.0% NDF, 14.3% CP) or pigeonpea (*Cajanus cajan*; 65.0% NDF, 12.6% CP). Legumes were supplemented at 50% of the diet and SBM fed to the average CP concentration (12.0%) of legume diets. Haylages were harvested, wilted to 45% DM, baled, wrapped in polyethylene and ensiled for 180 d. Each diet was fed to 7 lambs for 21 d, and then to 4 lambs for 21 d.

Intake of DM and OM (g/d) was greatest (P<0.01) in lambs fed annual peanut or SBM (819-748 and 723-668), and least (P<0.01) in lambs fed pigeonpea (421-400). Digestibility of DM was greatest (P<0.01) in sheep fed SBM (69%) and digestibility of OM was greater (P<0.01) in sheep fed BGH, SBM, peanuts, or cowpea (68-71%). Digestibility of NDF was greatest (P<0.05) in sheep fed BGH or SBM (70-72%). Intake of N (g/d) was greatest (P<0.01) in sheep fed annual peanut (18) followed (P<0.01) by SBM and perennial peanut (14-15), and least (P<0.01) in sheep fed pigeonpea (9). Digestibility of N was greatest (P<0.01) when SBM, annual or perennial peanut (67-70%) was fed and least (P<0.01) when pigeonpea (59.2%) was fed. Retention of N (g/d) was greatest (P<0.01) when sheep were fed annual peanut (7), followed (P<0.05) by perennial peanut, SBM and cowpea (4-5). Microbial N production was greater (P<0.05) when sheep were fed peanuts, SBM or BGH (10-12 g/d). Efficiency of microbial N production was not affected (P>0.10) by dietary treatment. The peanut haylages were the most promising legume haylage supplements for the lambs.

**Key Words:** Legume, Haylage, Digestibility

**599 Forage species alters animal performance, carcass quality, and fatty acid composition of forage-finished beef produced in summer months.** J. Schmidt\*, J. Andrae, S. Duckett, M. Miller, and S. Ellis, *Clemson University, Clemson, SC.*

Thirty Angus-cross steers were finished on either alfalfa (AL), bermudagrass (BG), chicory (CH), cowpea (CO), or pearl millet (PM), to assess the effects of these forages on animal performance, carcass quality and longissimus fatty acid composition. Using a complete randomized block design, ten 5-acre paddocks were blocked and assigned forage species (2 reps per species). Steers (n=3) were randomly assigned to paddocks and grazing began when adequate forage growth for individual species was present. Put and take grazing techniques were utilized. Steers were slaughtered when sufficient forage mass for individual forage species was no longer present to support animal gains or when average steer weight exceeded 568 kg. Data were analyzed using PROC MIXED of SAS. Average daily gains tended to be higher (P = 0.10) for AL than BG. Total grazing days (GD) ha<sup>-1</sup> were greatest (P = 0.02) for PM, with BG having more GD than CH. Average forage mass was highest (P = 0.02) for PM. Carcass weight tended to be higher (P = 0.08) for AL and CO than CH and PM. Dressing percentage was higher (P < 0.01) for AL, CH, and CO than BG and PM. Marbling scores were higher (P = 0.03) for CO than BG, CH and PM. Postmortem aging increased tenderness (P < 0.01). Shear force tenderness scores did not differ (P = 0.24) among treatments. Oleic acid concentrations tended to be greater (P = 0.08) for CO than AL and BG. Concentrations of trans-11 vaccenic acid were greater (P = 0.004) in BG and PM than in CH and AL, and CO was greater than AL. Concentrations of linolenic acid were greater (P < 0.01) in CH and CO than AL, BG, and PM. Conjugated linoleic acid (CLA cis-9 trans-11) concentrations were greatest (P < 0.01) in BG and PM. Concentrations of monounsaturated fatty acids were greater (P = 0.04) in AL and BG than CO. Omega-6 to Omega ratio was higher (P < 0.05) in PM than CO. Forage species utilized during the summer finishing period altered animal performance, carcass quality and fatty acid composition in beef cattle.

**Key Words:** Beef, Forages, Fatty Acid

**600 Performance of finishing steers on corn silage or low grain sorghum silage with corn oil supplementation.** V. A. Corriher\*, G. M. Hill, and B. G. Mullinix, Jr., *University of Georgia, Tifton.*

Beef steers (n=32; initial BW 524.9 ± 63.3 kg; age 24 mo.; Angus-X) were fed a free-choice TMR consisting of 55% corn silage (CS) or low-grain sorghum silage (SS) and 45% concentrate mix (88% ground corn, 10% SBM, 0.019% mineral/Rumensin/vitamin premix) on DM basis, without and with corn oil (7% of DMI). Low grain sorghum silage was used to simulate a grazing environment compared with high corn grain silage diet. Steers were ranked by BW, randomly assigned to dietary treatments and fed with Calan<sup>®</sup> gates for 78d. Steers were implanted with Component<sup>®</sup> on d1 of experiment. Steer BW were means of consecutive daily unshrunk BW. Steers were shipped to Cargill Taylor Beef (PA) and slaughtered at the end of the experimental period. Rib sections and subcutaneous fat samples were retained for fatty acid composition. Steer 78-d ADG had a silage × treatment interaction, ADG was higher for corn silage without corn oil (1.98 vs. 1.51 kg) and sorghum silage with oil (1.54 vs. 1.29 kg). Total DMI was higher for sorghum silage treatments; however, corn oil supplementation was not different (Table). Despite increased DMI for steers on sorghum silage treatments, 78-d ADG was higher for corn silage treatments. Steers on corn oil supplementation had higher concentrations of CLA isomer cis-9 trans-11 in longissimus dorsi and subcutaneous fat samples. A silage × treatment interaction occurred for the concentration of CLA isomer

trans-10, cis-12 in subcutaneous fat samples. Steers on corn silage with oil supplementation diets had higher concentrations of trans-10, cis-12. Steer HCW and QG (12=US Choice-) were higher for steers on corn silage. Corn oil supplementation increased QG however it decreased HCW of steers. Corn oil supplementation had no effect on steer performance; however, it increased CLA isomer concentrations.

**Table 1.**

	Corn	Sorghum	Oil	No Oil	SE	P<	
						Silage	Oil
Total DMI, kg	22.10	25.99	23.61	24.47	0.94	0.05	0.65
Total DMI/gain, kg	6.07	8.63	7.34	7.35	0.53	0.002	0.98
(LD) c9t11, g/100g	1.87	1.70	2.07	1.49	0.14	0.41	0.006
(LD) t10c12, g/100 g	0.079	0.097	0.094	0.082	0.024	0.61	0.75
(s.c.) c9t11, g/100 g	2.13	2.17	2.39	1.92	0.014	0.84	0.02
HCW, kg	370.21	354.25	354.34	370.13	11.48	0.33	0.34
QG	9.44	11.13	10.94	9.63	0.63	0.07	0.15

**Key Words:** Steer, Corn Oil, Fatty Acids