W122 Luster measurement in mohair produced by Angora goats. C. J. Lupton*, B. S. Engdahl, F. A. Pfeiffer, and J. W. Walker, *Texas Agricultural Experiment Station*, *San Angelo*.

Luster in mohair is the shiny appearance of the fibers when they are illuminated. This important trait contributes to the different and unique appearance of mohair compared to other animal fibers of similar physical dimensions. Luster is assessed subjectively by breeders, a practice that has resulted in a high level of luster in most Angora goat fleeces. Goniophotometers (GON) are used to provide standard measurements of luster in fibers. A GON test is expensive ($600 per 25 fibers) and is not used by breeders. The objective of this experiment was to evaluate 3 methods for their ability to produce low-cost, accurate measurements of luster. The methods were subjective scoring using 3 experienced individuals and objective measurement using near-infrared reflectance spectroscopy (NIRS, Model 6500M, Foss North America, Eden Prairie, MN) and automatic image analysis (Optical Fibre Diameter Analyser 100 [OFDA], BSC Electronics, Ardross, W. Australia), Three people scored luster (0 = no luster, 5 = excellent luster) in 89 parted fleeces. The correlation (r) between luster scores of the 3 appraisers ranged from 0.54 to 0.64 indicating the scores were not in close agreement. NIRS spectra were measured on greasy and cleansed samples (630) representing a broad range of Angora goat fleeces. Other properties measured on the samples using the OFDA included mean fiber diameter (SD and CV), medullation and opacity. Spectrally and visually different samples (8) were selected from this population (luster range 9.2 to 13.6%) for GON analysis. Standard GON results were used to develop a NIRS calibration equation (SEC and r^2 were 0.9% and 0.7, respectively) and a multiple regression equation ($P < 0.02$ for entry) incorporating fiber diameter and opacity for which r^2 was 0.9 and the SE of predicted luster was 0.6%. Agreement between the NIRS predictions and estimates from the regression equation was not perfect ($r^2 = 0.6$, slope = 0.7). Based on this small (but highly selected) sample, luster in mohair appears to be estimated more precisely and accurately from fiber diameter and opacity data than from NIRS spectra.

Key Words: Angora Goat, Luster, Mohair

W123 Effects of feed restriction and subsequent realimentation on tissue and mohair fiber by growing Angora goats. R. Puchala*, A. Patra, A. L. Goetsch, G. Animut, and T. Sahlu, *E (Kika) de la Garza American Institute for Goat Research, Langston University*, *Langston, OK*.

Forty-eight Angora goat wethers (16.7 ± 0.43 kg initial BW and 6 mo of age) were used in a 24-wk experiment to evaluate effects of level of feed intake on current and subsequent tissue (non-fiber) and mohair fiber growth. In Phase 1, 12 wk in length, different amounts of dehydrated alfalfa pellets were fed to provide ME according to NRC requirements adequate for tissue and mohair fiber growth (g/d) of 0 and 0 (0L), 15 and 1.5 (15L), 30 and 3.0 (30L), 45 and 4.5 (45L), 60 and 6.0 (60L), and 75 and 7.5 (75L), respectively. Alfalfa pellets were consumed ad libitum in Phase 2. Digestibility of OM was similar among treatments in both phases. In both phases ME intake (MEI) increased linearly ($P < 0.05$) with increasing level of DMI in Phase 1 (Phase 1: 5.40, 5.24, 6.00, 7.15, 7.89, and 8.04 MJ/d; Phase 2: 10.93, 11.00, 12.02, 13.50, 13.59, and 16.32 MJ/d for 0L, 15L, 30L, 45L, 60L, and 75L, respectively). Energy expenditure in Phase 1 increased linearly ($P < 0.05$) with increasing level of DMI (3.67, 3.87, 3.91, 4.18, and 5.20 MJ/d for 0L, 15L, 30L, 45L, 60L, and 75L, respectively) and was similar among treatments in Phase 2 (6.45 ± 0.40 MJ/d). Tissue growth increased linearly ($P < 0.05$) with increasing DMI in Phase 1 (15.3, 30.9, 49.2, 58.9, 62.5, and 72.1 g/d) and was similar among treatments in Phase 2 (105.6, 108.3, 91.9, 81.9, 76.0, and 97.0 g/d for 0L, 15L, 30L, 45L, 60L, and 75L, respectively). Mohair fiber growth was similar among treatments in Phase 1 (6.6, 6.6, 6.0, 6.2, 7.8, and 7.0 g/d) and in Phase 2 (6.6, 6.8, 5.5, 6.1, 9.2, and 7.3 g/d for 0l, 15l, 30l, 45l, 60l, and 75l, respectively). mohair diameter increased linearly ($p < 0.05$) with increasing dmi in phase 1 (21.7, 21.8, 22.1, 23.4, 23.8, and 23.0μm) and in phase 2 (25.4, 25.5, 26.0, 27.1, 27.0, and 27.1μm for 0l, 15l, 30L, 45L, 60L, and 75L, respectively). In conclusion, growing Angora goats partition nutrients to maintain mohair fiber growth with limited MEI and decrease energy expenditure to lessen the ME requirement for maintenance, resulting in compensatory tissue growth upon realimentation.

Key Words: Angora Goats, Feed Restriction, Mohair

W124 Effects of selection for increased juniper consumption on body weight and mohair production of Angora goats. F. A. Pfeiffer*, E. S. Campbell, B. S. Engdahl, T. D. Lovett, C. J. Lupton, C. A. Taylor, D. F. Waldron, and J. W. Walker, *Texas Agricultural Experiment Station*, *San Angelo*.

Juniper infestation is undermining the productivity of rangelands in the Edwards plateau region of western Texas. Angora goats have demonstrated their ability to consume considerable quantities of low quality browse plants including juniper. A selection experiment for above- (high, H) and below-average (low, L) juniper consumption in Angora goats has been in progress for 4 yr. Juniper consumption was measured using fecal near-infrared reflectance spectroscopy. An objective of the experiment was to establish the effects of the selection protocol on BW, mohair production, and fiber characteristics. Mature females (age > 1.5 yr, 767 records) and kids (114 records) were weighed and shorn twice a year (February and August) having been maintained for most of the year in the same range environment. Yearling males (40 records) were removed from the range to participate in a central performance test in which weight gain was also measured. Raw fleeces were weighed and analyzed for clean yield, fiber diameter, staple length, medullation, and curvature (a measure of crimp). Clean mohair production efficiency ranged from 0.027 to 0.052 to 0.073 kg/kg BW for kids, mature females, and pen-fed yearling males, respectively, with no differences ($P > 0.05$) between H and L goats in any group. Mature H females produced slightly finer (1 micron, $P < 0.005$) mohair with correspondingly higher (1 deg/mm, $P < 0.001$) curvature than L goats. The opposite trends were present in the kids, those animals resulting from the most selection, and no difference ($P > 0.55$) was present between the fiber diameters of H and L male goats. There was a tendency ($P = 0.07$) for L male goats to have higher BW than H goats. For all other fiber traits, H did not differ ($P > 0.1$) from L goats. To date, selection for increased and decreased juniper consumption in free-ranging Angora goats has produced either very small or no differences in BW or fiber traits.

Key Words: Angora Goat, Mohair, Juniper

W125 Participant demographics of a web-based certification program for meat goat producers. R. C. Merkel*, T. A. Gipson, S. P. Hart, and T. Sahlu, *E (Kika) de la Garza American Institute for Goat Research, Langston University*, *Langston, OK*.

In 2006, a Langston University-led consortium of 11 universities and 5 meat goat producer groups unveiled an on-line training and certification program (http://www2.luresext.edu/training/qa.html). The program consists of 22 learning modules. Participants take pre- and post-tests to pass the 16 required and a minimum of 3 elective modules for certification. As of February, 2007, 256 participants from 9 countries (US – 245, Canada – 3, India – 2, Australia, Jamaica, Malaysia, Nigeria, Pakistan, Romania – 1 each) have registered for the program. Thirty-nine states are represented with the top 5 states representing 55% of total participants (OK – 59, MO – 24, TX – 20, TN and KS – 16 each). Sixty-five percent of respondents classified themselves as part-time farmers/ranchers, 19% full time, and 16% no response. Fifty-one percent classified farm size as less than 40 acres and only 16% > 160 acres. Average herd size for 54% of respondents was 49 or fewer animals (34% < 25 goats). Only 13% of respondents owned >100 goats. Males comprised 56% of participants and females 37%, with the remainder not responding. Sixty-three percent of respondents reported membership in the American Boer Goat Association; 16% American Meat Goat Association; 13% American Kiko Goat Association; 6% U.S. Boer Goat Association; and 4% International Kiko Goat Association. Demographic data suggest that an on-line certification program is an acceptable method to provide information to small holder meat goat producers.

Key Words: Goats, Certification, Internet

W126 Effectiveness of a web-based certification program for meat goat producers. S. P. Hart*, R. C. Merkel, T. A. Gipson, and T. Sahlu, *E (Kika) de la Garza American Institute for Goat Research, Langston University*, *Langston, OK*.

In 2006, a Langston University-led consortium of 11 universities and 5 meat goat producer groups unveiled an on-line training and certification program (http://www2.luresext.edu/training/qa.html). The program consists of 22 learning modules in which participants take pre- and post-tests (requiring a score of ≥85%) to pass the 16 required and a minimum of 3 elective modules for certification. As of February, 2007, 256 participants have registered for the program. Least square means were lower for pre- vs post-tests (68 vs 90% ± 1.53; $p<0.001$) with an average increase in score of 22 percentage points. Largest increases in pre- vs post-test scores were seen in the Reproduction (48 vs 89% ± 3.7) and Nutrition (54 vs 90% ± 3.0) modules with lowest increases in test scores seen in the Livestock Guardian Dogs (77 vs 91% ± 5.4), Herd Health Procedures and Prevention (73 vs 90% ± 4.6), and Marketing (75 vs 87% ± 2.7) modules. Knowledge transfer was evident through the increases in test scores. These data suggest that an on-line testing and knowledge dissemination program is acceptable for many goat producers as a means to increase knowledge of goat production practices.

Key Words: Goats, Certification, Internet

W127 Goat conferences in Arkansas. J. A. Pennington*, *University of Arkansas Cooperative Extension Service*, *Little Rock*.

Surveys were conducted of goat conferences in Arkansas to determine needs and characteristics of producers as the conferences have evolved from a single youth dairy goat conference, initiated in 1994, to ten goat conferences throughout the state in 2006. Average attendance in 2006 at the conferences was 92; attendance on Saturdays averaged 121 and attendance on weekdays averaged 63. Conference attendees were primarily interested in meat goats (68% meat goats, 14% dairy goats, and 18% combination of meat goats, dairy goats, and/or sheep). Additionally there were several county workshops. Surveys of goat producers at the conferences indicated that the topics most requested were 1) marketing of the goats, 2) controlling internal parasites, and 3) feeding and forages for goats. Other topics requested included diseases and their treatment, kidding management, predator control, breeding and genetics, fencing, and product preparation. Youth activities for fitting and showmanship were included in all Saturday programs which had a registration fee. Speakers at the conferences include state extension agents and specialists, local producers, usually a goat specialist from an adjoining state, and related industry personnel. In 2006, five no-fee conferences with the Natural Resources Conservation Service consisted of lecture topics in the a.m. and a farm visit in the p.m. to demonstrate forages, facilities, and fencing. Evaluations for conferences on Saturdays during the past four years ranged from 4.2 to 4.7 out of 5.

Key Words: Conference, Extension, Goat

W128 Estimation of meat goat carcass composition using regression analysis. K. E. Logan*, H. N. Zerby, S. J. Moeller, T. J. Fraley, and D. A. Mangione, *The Ohio State University*, *Columbus*.

Percentage Boer meat goats (N = 135) ranging in live weight from 15.5 to 45 kg (avg. = 29.5, std. dev. = 6.6 kg) were harvested to assess the impact of live and carcass measurements as predictors of carcass primal (P) and total muscle (TM) weights. Goats were obtained from two sources: auction market (N = 104) and a local exhibition (N = 31). Live weight (LW), carcass weight (CW), backfat thickness (BF), ribeye area (REA), weight of primal cuts (leg, loin, rack, and shoulder), and complete carcass dissection (weight of fat, bone, and muscle) were recorded. Data were analyzed as a complete set and within CW subclasses using stepwise regression ($P < 0.15$). Dependent variables were P and TM weights. Model R^2 for estimation of P from significant independent variables LW, REA and BF was 0.91 with a partial R^2 of 0.86 for LW. The R^2 for estimation of P from CW and BF was 0.97 with a partial R^2 of 0.97 and 0.002, respectively. Estimations of TM from a model including LW (partial $R^2 = 0.81$) and REA (partial $R^2 = 0.07$) or CW (partial $R^2 = 0.94$) and REA (partial $R^2 = 0.005$) were slightly reduced when compared with estimation of P. Subset analyses were conducted within the following CW intervals; < 20 (N = 11), 21 to 25 (N = 19), 26 to 30 (N = 49), 31 to 35 (N = 18), 36 to 40 (N = 11), 41 to 45 (N = 12) and ≥46 (N = 11). Model R^2 within subset for estimation of P from CW, REA and BF ranged from 0.46 to 0.80 and was lowest in the 26 to 30 kg weight range. Partial R^2 for REA were significant in the < 20 ($R^2 = 0.06$) and 26 to 30 ($R^2 = 0.05$) CW ranges only for the estimation of P. Backfat thickness contributed significant partial R^2 of 0.04, 0.25, and 0.06 in CW ranges 26 to 30, 31 to 35, and

36 to 40 kg, respectively for estimation of P. Model R^2 were reduced in all CW subclasses when estimating TM, regardless of significant independent effects in the model. Results indicate that CW and LW account for a large proportion of total variation in P and TM across the data set and within CW subclasses, and the incremental increase in R^2 is small when adding BF and/or REA to the prediction model.

Key Words: Composition, Dissection, Goat

W129 Effect of hydrodynamic pressure processing on chevon quality characteristics. K. R. Eega*[1], J. H. Lee[1], M. B. Solomon[2], T. D. Pringle[3], K. W. McMillin[4], and G. Kannan[1], [1]*Fort Valley State University*, *Fort Valley, GA*, [2]*USDA/ARS Food Technology and Safety*, *Beltsville, MD*, [3]*University of Georgia*, *Athens*, [4]*Louisiana State University*, *Baton Rouge*.

Hydrodynamic pressure processing (HDP) technology, which involves exposure of packaged meat to a supersonic shock wave under water, created by a small amount of explosive, has been shown to improve meat tenderness; however, its effect on chevon tenderness has not been studied. The objective of this experiment was to determine the effects of HDP on the quality characteristics of boneless chevon leg steaks. Eighteen male Spanish goats (8 mo of age) were slaughtered and the carcasses kept at 2°C for 24 h, fabricated, and the leg primal cuts sliced into 2.5 cm-thick steaks. The bone from each slice was removed and the steaks were vacuum packaged and frozen. The steaks were transported frozen to the Food Technology and Safety Lab at Beltsville, MD, where they were thawed overnight (4°C), and then repackaged for HDP processing. Steaks from the left leg of each carcass were subjected to HDP treatment and those from the right were kept as untreated controls (n = 18/treatment). Cooking loss, Warner-Bratzler shear force value, thiobarbituric acid reactive substances (TBARS), and color values were determined on the semimembranosus muscles of both treated and control steaks. Hydrodynamic pressure processed steaks had lower shear force values compared with control steaks ($P < 0.05$). Cooking loss tended to be higher ($P < 0.1$; SEM = 1.11) in treated steaks (31.9%) compared with control steaks (29.6%). The TBARS values were 1.2 and 1.1 mg melonaldehyde/kg sample, respectively, in treated and control steaks. The CIE L*, a*, and b* color values determined after a 40-min bloom period were not different between HDP-treated and control steaks. The results indicate that HDP processing can improve the tenderness of chevon without significantly affecting other meat quality characteristics.

Key Words: HDP Processing, Chevon, Tenderness

W130 Quality characteristics of jerky made from Hydrodynamic Pressure processed (HDP) chevon and beef. K. R. Eega*[1], J. H. Lee[1], M. B. Solomon[2], T. D. Pringle[3], K. W. McMillin[4], and G. Kannan[1], [1]*Fort Valley State University*, *Fort Valley, GA*, [2]*USDA/ARS Food Technology and Safety Laboratory*, *Beltsville, MD*, [3]*The University of Georgia*, *Athens*, [4]*Louisiana State University*, *Baton Rouge*.

Hydrodynamic pressure (HDP) processing has been reported to improve tenderness of beef and pork, but its effect on goat meat (chevon) has not been studied. This experiment was conducted to determine the effects of HDP processing on quality characteristics of chevon and beef jerky. Vacuum packaged frozen boneless chevon leg cuts (n = 32) and cuts from beef top rounds (n = 32) were thawed and either subjected to HDP processing or kept as untreated controls (n = 16/treatment/species). A commercial seasoning was used to produce jerky from Semimembranosus muscle strips ($10 \times 5 \times 0.5$ cm) obtained from each cut. The Commission Internationale de I'Eclairage (CIE) L*, a*, and b* color values of chevon jerky were higher in the HDP-processed group compared with the control group, and the average color values were higher ($P < 0.01$) in chevon compared with beef jerky. Dry matter and ash contents were higher in chevon compared with beef jerky ($P < 0.01$), while the fat content was not influenced by animal species. Tenderness scores from an eight-member trained panel were higher ($P < 0.01$) for beef (4.7 ± 0.11) compared with chevon jerky (3.9 ± 0.11), with jerky samples from HDP-processed beef receiving the highest tenderness ratings. Juiciness and flavor scores were also higher ($P < 0.01$) for beef jerky compared with chevon jerky. The TBARS values of vacuum-packaged chevon jerky increased with storage time (30, 60, or 90 d at 2°C), while the values did not change in beef jerky (species × storage time, $P < 0.05$). Yeasts and molds were not detected and the total plate counts were generally < 1.00 $\log_{10}$ CFU/g in jerky samples during the 90-d storage period. Results showed that HDP processing significantly improved the quality characteristics of jerky. Jerky made from beef had better organoleptic and storage properties than chevon jerky.

Key Words: Chevon, HDP Processing, Jerky

W131 Chemical composition and quality of chevon as influenced by a diet high in condensed tannins. M. Vanguru*, J. H. Lee, D. A. Moore, B. Kouakou, T. H. Terrill, and G. Kannan, *Fort Valley State University*, *Fort Valley, GA*.

Sericea lespedeza, a legume high in condensed tannins (CT), has been reported to decrease nematode infections in meat goats, although its effect on the quality of meat has not been studied. This study was conducted to determine the effects of a high CT-containing diet on goat meat (chevon) quality characteristics. Twenty Boer × Spanish goats (6 mo of age; BW = 19.2 ± 0.74 kg) were assigned to pens (5 goats/pen), and each pen was allotted to one of two dietary treatments of 75% hay and 25% supplement: sericea hay plus a corn-based supplement (18 % CP) consisting predominantly of corn and soybean meal for 14 wk (SER) or Bermuda grass hay plus the corn-based supplement (BER; n = 10 goats/treatment). At the end of the feeding trial, goats were slaughtered using standard procedures. After 24 h of cooler storage (4°C), the carcasses were fabricated to obtain 2.5-cm thick loin chops (Longissimus dorsi, LD) for meat quality analysis. No significant differences were found between SER and BER groups in moisture (73.2 vs 72.8%), protein (24.7 vs 23.8%), fat (3.11 vs 2.71%), and ash (1.83 vs 1.59%) percentages of LD muscles. The L* (lightness), a* (redness), and b* (yellowness) color values were not affected by the dietary treatment, although the L* values tended to be higher ($P < 0.10$) in loin chops from the SER group compared with those from the BER group. No differences ($P > 0.05$) were found in the thiobarbituric acid reactive substances in LD muscles between the two treatment groups. The Warner-Bratzler shear force values (4.76 vs 4.66 ± 0.43 kg) and cooking losses (19.6 vs 19.1 ± 1.13 %) of loin chops were also not influenced by the dietary treatments. The results indicated that a diet containing high levels of CT did not influence the composition and quality of meat in goats, although high CT diets may affect meat color.

Key Words: Chevon Quality, Goats, Sericea Lespedeza

W132 The small ruminant nutrition system: Development of a goat submodel. A. Cannas*[1], L. O. Tedeschi[2], and D. G. Fox[3], [1]*University of Sassari*, *Sassari, Sardinia, Italy*, [2]*Texas A&M University*, *College Station*, [3]*Cornell University*, *Ithaca, NY*.

The Small Ruminant Nutrition System (SRNS) is a computer model based on the structure of the Cornell Net Carbohydrate and Protein System for Sheep. A version of the SRNS for goats is under development. In the SRNS for goats, energy and protein requirements are predicted based on the equations developed for the SRNS for sheep, modified to account for specific requirements of goats. Energy requirements for basal metabolism of dairy goats averaged 125%, 117%, and 105% of those of sheep for dairy goats, Angora goats, and indigenous goats, respectively. Maintenance MP requirements were the same as used for sheep regarding urinary and fecal endogenous nitrogen, but hair and scurf were modified for goats. NE requirements for lactation were specific for goats. The relationships among body condition score (BCS, 0-5 scale), full BW (FBW), body composition and growth requirements developed for sheep was used for goats. The SRNS submodel to predict supply of nutrients was used for goats as well, except for the prediction of DMI, which was based on equations specific for goats. The evaluation of the SRNS for goats based on literature data showed that while in different breeds of goats it predicted very accurately the relationship between BW and BCS at any BCS, but it markedly over-predicted body fat concentration in the empty BW. Based on data gathered from the literature (24 treatment means), the SRNS predicted the growth rate of kids with good accuracy (mean bias was 8 g/d and root of the MSE of the prediction was 26.2 g/d). Further improvements of the goat submodel are planned to account for feed selectivity, body composition of different breeds, physical activity of grazing goats, and environmental effects on requirements and intake.

Key Words: Feeding Systems, Goats, Modeling

W133 Short-term trends of Boer and Kiko bucks in a central performance test. T. A. Gipson*[1], L. Dawson[2], and T. Sahlu[1], [1]*E (Kika) de la Garza American Institute for Goat Research, Langston University*, *Langston, OK*, [2]*Oklahoma State University*, *Stillwater*.

Increasingly meat goat producers in the U.S.A. are basing selection decisions upon performance traits and are relying upon central performance tests to objectively select bucks. Since 1999, the Langston University central performance test (LUCPT) has evaluated 398 bucks representing 70 breeders and 8 states. Two breeds have been tested, Boer and Kiko, the former accounting for 95% of the bucks enrolled. Therefore, the objective of this study was to evaluate the trends of the performance traits over the last 8 years (1999 to 2006) of LUCPT bucks. Traits evaluated were ADG, feed:gain ratio (FE), loin-eye area (LEA), and residual feed intake (RFI). An analysis of covariance was conducted with performance traits as the dependent variables, breed as the independent variable, and linear and quadratic effects of year as covariates. Over the 8 years, ADG increased linearly (yearly rate = 7.3 (g/d)/yr±1.25); FE decreased linearly (yearly rate = -0.08/yr±0.029); LEA increased quadratically (linear yearly rate = 1.15 cm^2/yr±0.223; quadratic yearly rate = -0.10 (cm^2)/yr^2±0.024); and RFI increased quadratically (linear yearly rate = 0.039 (g/d)/yr±0.0162; quadratic yearly rate = -0.005 (g/d)/yr^2± 0.0017). The two latter traits increased then decreased over time so that the traits in 2006 were virtually the same as in 1999. Breed influenced ($P < 0.05$) all performance traits: ADG averaged 277±2.9 for Boer and 206±13.8 g/d for Kiko; FE averaged 6.8±0.07 for Boer and 7.6±0.32 for Kiko; LEA averaged 11.4±0.11 for Boer and 9.2±0.53 cm^2 for Kiko; and RFI averaged -0.03±0.008 for Boer and 0.04±0.038 g/d for Kiko. Phenotypically across breeds, FE was positively correlated ($P < 0.05$) with LEA ($r=0.18$) and with RFI ($r=0.41$) but negatively correlated with ADG ($r=-0.49$). ADG was positively correlated ($P<0.05$) with LEA ($r=0.24$). Generally, ADG increased and FE decreased in desirable directions indicating that meat goat producers may be basing selection upon economically important traits, especially ADG which is easily measured on-test and on-farm. LEA and RFI remained unchanged, indicating that meat goat producers may not consider them important or they do not understand them.

Key Words: Central Performance Test, Goat

W134 Influence of dietary condensed tannins on gastrointestinal tract, skin, and carcass bacterial counts in meat goats. J. H. Lee*, D. A. Moore, M. Vanguru, B. Kouakou, T. H. Terrill, and G. Kannan, *Fort Valley State University*, *Fort Valley, GA*.

Diets high in condensed tannins (CT), such as sericea lespedeza hay, have been reported to reduce gut microbial loads in ruminants. This experiment was conducted to determine the effects of feeding higher levels of CT on gut, skin, and carcass microbial counts in goats. In a Completely Randomized Design, twenty Boer × Spanish kids (6 mo of age) were fed ground sericea (2 pens, SER) or Bermuda grass hay (2 pens; BER), 75% of daily intake for 14 wk with a corn-based supplement (25% of intake) (n = 10 goats/treatment). At the end of the feeding trial, the animals were slaughtered using standard procedures. Skin swab samples were made on the hind legs (5 × 5 cm area) prior to slaughter. Immediately after evisceration, rumen and rectal samples, as well as carcass swab samples were collected to assess bacterial loads. Concentrations of rumen volatile fatty acids were significantly different between dietary treatments. Goats fed sericea hay had higher ($P < 0.05$) contents of butyric (8.66 vs 7.16 mM), isobutyric (1.94 vs 1.44 mM), isovaleric (3.03 vs 2.13 mM), and valeric (1.43 vs 1.07 mM) acids than those fed Bermuda hay; however, the content of acetic acid (78.6 vs 64.4 mM) was higher ($P < 0.05$) in the BER group than in SER group. Generic E. coli (2.24 vs 0.93 $\log_{10}$ CFU/g) counts of rumen contents were higher in the SER group compared with BER group. However, microbial counts in feces were not different between dietary treatments. The aerobic plate counts on skin in the SER and BER groups were 4.58 and 4.46 $\log_{10}$ CFU/cm^2, respectively ($P > 0.05$). Carcass aerobic plate counts were 3.12 and 2.65 $\log_{10}$ CFU/cm^2 in SER and BER groups, respectively ($P > 0.05$). Total coliform and E. coli counts on skin and carcass were estimated to be <1.00 $\log_{10}$ CFU/cm^2. The results indicated that CT in the diet may influence rumen volatile fatty acid composition, but may not reduce the gut bacterial loads.

Key Words: *E.coli*, Goat, Sericea lespedeza

W135 Dietary regimen and gastrointestinal tract microbial loads in meat goats. J. H. Lee*, B. Kouakou, and G. Kannan, *Fort Valley State University*, *Fort Valley, GA*.

Microbial load in the gastrointestinal tract (GIT) can be related to contamination of skin/hide and carcass surfaces in ruminants. Thirty-six Boer × Spanish goats (BW = 17.7 kg) were used to determine the effects of dietary treatment on volatile fatty acid concentrations (VFA) in rumen and microbial loads of GIT contents. Animals were randomly allotted to nine pens, and each pen (4 goats/pen) was assigned to one of three dietary treatments for 90 d (3 pens/treatment): (1) a hay diet, consisting of alfalfa (Medicago sativa) hay alone (H); (2) a 18% CP concentrate diet, consisting predominantly alfalfa meal and yellow corn (C); or (3) a combined diet, consisting of the hay diet for the first 45 d, followed by the concentrate diet (HC). At the end of the feeding trial, goats were slaughtered using standard procedures. Immediately after evisceration, rumen fluid and rectal samples were aseptically collected from each animal to determine the microbial loads. Rumen fluid was also collected and prepared for determination of VFA. No significant differences were found in rumen fluid VFA among treatments, although the acetic acid concentration was high in the H group (66.27 mM), low in HC group (34.61 mM), and intermediate in C group (44.18 mM; $P < 0.05$). The total plate counts were not different ($P > 0.05$) among treatments for rumen fluid and fecal (rectal) samples. The E. coli counts in the rectal samples were lower in the H group (6.43 $\log_{10}$ CFU/g), compared with C (8.21 $\log_{10}$ CFU/g) or HC (8.40 $\log_{10}$ CFU/g) groups. However, no significant differences were found in the E. coli counts of rumen fluid samples among the dietary treatments. The mean (± SEM) rumen E. coli counts were 1.38, 1.65, and 2.51 ± 0.560 $\log_{10}$ CFU/g in H, C, and HC groups, respectively. The results indicated that either concentrate diet or a diet change from hay to concentrate may increase fecal shedding of E. coli in meat goats.

Key Words: Diet, *E. coli*, Goats

W136 Impact of types of pelleted feed and two pellet to hay ratios on the development of urolithogenic compounds in meat goats. K. Sullivan[1], S. Freeman*[1], M. Poore[1], E. van Heugten[1], K. Ange-van Heugten[1], and B. Wolfe[2], [1]*North Carolina State University*, *Raleigh*, [2]*The Wilds*, *Cumberland, OH*.

Goats and giraffes both have documented problems with urolith formation. Since research in giraffes poses logistical challenges, 18 buck goats were used as a model. Our objective was to determine the impact of two commercial pellets used as feed for giraffes (ADF-16, A; and Wild Herbivore, W) and two hay to pellet ratios (80:20, 80H; and 20:80, 20H) in a 2 × 2 factorial design. Total feces and urine were collected over 2 5-d periods separated by 9d for N and mineral balance determination. Fresh urine samples were collected twice during each collection period and evaluated microscopically for urolithic crystal content. Ruminal fluid was collected by rumenocentesis 2 hr post-feeding once at the end of the trial. Analysis of feedstuffs showed % CP, % NDF, % Ca, and % P to be 20.2, 43.9, 1.5, and 0.2 for the alfalfa hay; 19.4, 30.0, 0.8, and 0.7 for A; and 14.2, 54.4, 1.0, and 0.4 for W, respectively. DM and water intake were higher for the 20H than 80H bucks ($P \leq 0.05$ and 0.10, respectively); however, there were no treatment differences in DM digestibility. Retention of N was higher in bucks fed 20H diets ($P \leq 0.05$). Crystals observed were predominantly calcium phosphate. Crystal counts were not influenced by diet; however, crystal scores were higher in animals receiving 20H diets ($P \leq 0.10$). Ruminal NH_3 was higher in A bucks than W while urine pH was higher in W bucks than A. Urine pH was also higher for 80H than 20H ($P \leq 0.05$). Our data suggest that the proportion of hay offered to the goats was a greater influence on urinary calcium phosphate crystals than was pellet type.

Table 1. Impact of hay level and pellet type on meat goats

DM Basis	80HA	80HW	20HA	20HW	
% CP	20.1	19.0	19.5	15.4	
%NDF	41.1	46.0	32.8	52.3	
% Ca	1.3	1.4	1.0	1.1	
% P	0.3	0.3	0.6	0.4	
DMI (g/d)	1042	990	1198	1378	H[1]
H_2O intake (L/d)	2.8	2.9	3.2	3.4	H[2]
% DM dig	67.5	67.7	69.2	66.6	NS
N retention (g/d)	6.9	7.3	10.5	10.8	H[1]
Urine pH	8.6	8.9	8.4	8.7	H[1], P[1]
Crystal score	1.8	2.0	2.8	2.8	H[2]
Crystal count	48.8	136.5	205.6	149.8	NS
Ruminal NH_3 (mg/dl)	24.5	14.0	30.0	11.8	P[1]
Ruminal pH	6.25	6.60	6.31	6.34	NS

[1] $P \leq 0.05$ for H, P [2] $P \leq 0.10$ for H, P

Key Words: Hay to Concentrate Ratio, Meat Goats, Uroliths

Nonruminant Nutrition: Feeder Pig and Sow Nutrition II

W137 Comparison and accounting for differences of three phytase activity assay methods. J. D. Weaver* and X. G. Lei, *Cornell University*, *Ithaca, NY*.

Phytases are now widely used throughout the world as feed additives for simple-stomached animals to increase phosphorus bioavailability and reduce phosphorus content in the excreta. Phytase activity is measured colorimetrically by the complexing of molybdenum with liberated phytate-phosphate. There are three different methods of assaying phytase activity: the molybdenum blue method with reduction of the phosphomolybdate complex by ascorbic acid (method 1), the molybdovanadate method (method 2), and the acetone phosphomolybdate method (method 3). Since different conditions may affect enzyme activity, we compared these three methods in order to characterize the relative impact of each assay condition on the activity outcome. Two commercialzed phytase enzymes, *Aspergillus niger* PhyA and *Escherichia coli* AppA2, were used for the assay comparison. When PhyA samples were analyzed, method 2 gave different ($P < 0.05$) activity values from that of method 1 or 3. In the case of AppA2 enzyme, all three methods gave different ($P < 0.05$) activity values. The greatest disparity was between methods 1 and 2 for AppA2 (2.8-fold, $P < 0.05$), and this difference was attributed to buffer, 39%; pH, 30%; and Triton X-100 and bovine serum albumen, 32%. The lower substrate concentration of method 3 versus method 1 reduced the activity of PhyA by 22%, without affecting the activity of AppA2. The presence of Trtion X-100 and bovine serum albumen in the exraction buffer for AppA2 tended to increase the phytase activity value ($P = 0.06$-0.08). These results help clarify discrepancies between various research groups and assist consumers in choosing a phytase additive.

Key Words: Phytase, Assay, Conditions