differences (P>.20) in the TPT between C calves and the 10- to 22-wk-old calves. However, 6-wk-old calves had higher TPT than C at -72 h (P=.0001), and at 24 (P=.002) and 48 h (P=.0004) after treatment, but the values were not different at 12 h (P=.06). While the overall TPT (mean of 12 to 48 h data) after treatment were higher in 10-wk (P=.004), 14-wk (P=.0001), 19-wk (P=.0001) and 22-wk-old (P=.03) calves than their respective values at -72 h, the TPT values did not change with time in C (P=.07) and 6-wk-old calves (P=.94). In conclusion, calves at 6 wk of age are less sensitive to thermal pain than older calves (10- to 22-wk), and their sensitivity to pain is not modified by castration. The TPT of the older calves (10- to 22-wk) increased following castration, indicating the presence of stress-induced hypoalgesia.

Key Words: Cattle, Castration, Hypoalgesia

W117 Effects of age at transport on development of neonatal dairy calves. T. A. Johnson*[1], S. D. Eicher[2], J. N. Marchant-Forde[2], and A. G. Fahey[1], [1]*Purdue University, West Lafayette, IN,* [2]*USDA-ARS, West Lafayette, IN.*

Transportation stress at an early age can influence performance and the developing immune system. The purpose of this study was to evaluate the effects of age at transport on growth and health of neonatal calves. Holstein calves (n=47) were randomly assigned to treatments that were by age at transport; 2-3 d (A), 4-5 d (B), or 6-8 d (C) within a completely randomized design. Colostrum was given for the first 24 h after birth and followed by 2 daily feedings of milk replacer (4 L/d) and ad libitum grain-based dry feed. Calves were transported (6 h) and then placed in outdoor individual hutches. Weights were collected pre- and post-transport then on d 7, 14, 21, 28, 35, and 42. Clinical and fecal scores, and nasal and ocular discharge were evaluated five times a wk for each calf. Repeated procedures in Mixed Models of SAS were used to analyze the data. Calf weights decreased from d 0 through post-transport for all treatments, then increased throughout the rest of the study (P< .05). Intake also increased over time (P<.05). Fecal scores were affected by treatment and time (P<.05), with group C having lower fecal scores throughout the 5 wk and all group scores decreasing over time. Additionally, the B group had greater (worsened) fecal scores at wk 2 than group C (P<.05) and tended to have greater scores than group A (P=.10). Eye lacrimation increased over time (P<.05), but was not different among treatments. Nasal discharges were different over time (P<.05), and tended to be different by treatment (P=.06). The A group had greater nasal discharge scores compared to the C group at wk 1 to 5, and than group B at wk 5 (P<.05) and tended to be greater (P=.07) than group B at wk 1 and 2. Clinical scores were different over time (P<.05), and at wk 5 the A clinical score was less than that of the C group (P<.05) and tended to be less than that of the B group (P=.06). These data suggest that calves may have increased susceptibility to intestinal disease when transported at 4 to 5 d-of-age and respiratory disease when transported at 2 to 3 d-of-age.

Key Words: Dairy calves, Transport, Stress

Goat Species: Forage/Browse Utilization

W118 Goat kid preference for forage. T. W. White*, H. G. Bateman, C. C. Williams, and S. Alford, *Louisiana State University Agricultural Center, Baton Rouge, LA.*

Six Boer x Spanish wether kids (mean BW = 18.7 ± 0.68 kg) were used in a preference experiment comparing alfalfa hay (AH), Coastal bermudagrass hay (CBH), fresh cut wheat (W), oat (O), white clover (WC), crimson clover (CC), rape (R), mustard (M), or turnip (T) forage. Fresh forages were cut daily, and all forages were sampled prior to feeding at 0800. Samples of each forage were composited weekly for analysis. Kids were exposed to each forage for 2 d prior to beginning the experiment. During the experiment, each kid was randomly offered known weights of two forages simultaneously in every combination for 2 d. After 3 h, remaining forages were removed and weighed and DMI calculated for each forage. Kids had access to grass hay until the next day. Data were analyzed by ANOVA with preplanned contrasts. Average DM consumption of the respective forages was 235, 195, 97, 113, 9, 15, 79, 32, and 37 g per day. As fed consumption was 260, 213, 560, 589, 48, 88, 569, 265, and 299 g per day. Average consumption as fed was higher ($P < 0.01$) for fresh forage than hay; however, on DM basis this was reversed ($P < 0.01$). Kids preferred AH ($P < 0.01$) to CBH on DM basis. Preference for fresh forages was similar when expressed on fresh and dry basis. Consumption of O and W was higher ($P < 0.01$) than for M, R and T or CC and WC. Kids preferred R ($P < 0.01$) to M or T. Kids consume relatively high amounts of O, W, and R but will ingest more DM in a given time when fed hay.

Key Words: Goats, Forage, Preference

W119 Effect of feeding shrub and tree leaves on carcass characteristics in growing goat kids. M. Guerrero-Cervantes, A. S. Juarez-Reyes, F. Rios-Rincon, and M. A. Cerrillo-Soto*, *Universidad Juarez del Estado de Durango. Durango, Dgo. Mexico..*

Foliage from shrubs and trees is an important source of protein, vitamins and minerals in arid regions specially during the dry season when other sources of food are scarce. Therefore, a study was undertaken to evaluate the effect of supplementing *Quercus grisea*, *Quercus eduardii*, *Acacia shaffneri*, and *Opuntia spp.* leaves to an oat straw-based diet on performance and carcass traits in male kids. Twenty intact male kids (14.9 ± 0.7 kg BW) were blocked by weight and randomly assigned to one of five treatments, four supplements and one control. The leaves were included in a proportion of 15% of the diet (isonitrogenous, CP = 14.2%). The kids were fed in individual stalls for an average of 120 days before they were humanely slaughtered. Analysis of variance (SAS) was conducted for a completely randomized design using live weight as covariate. Slaughter weights were similar for all treatments (P>0.05). Hot carcass weights were similar in kids supplemented with *Q. eduardii*, *Q. grisea* and *A. shaffneri* but were heavier than for kids fed *Opuntia* or control diets (P<0.05). Kids supplemented with *Q. eduardii* had the heaviest empty body weight (P<0.05). Kids fed *Q. grisea* and *A. shaffneri* had similar empty body weight (P>0.05) but values were greater than for kids fed *Opuntia* or control diets (P<0.05). A similar tendency was noted for rib eye area. Dressing percentages were similar among treatments (P>0.05). It is concluded that feeding leaves from shrubs and trees commonly consumed by range animals might improve goat production via enhanced carcass characteristics.

	Treatments				
Item	*Querus eduardii*	*Quercus grisea*	*Acacia shaffneri*	*Opuntia spp.*	Control
Initial weight (kg)	15.7±2.4	15.2±1.91	15.1±1.3	14.6±1.1	14.1±0.7
Slaughter weight (kg)	25.2±3.6	23.2±1.8	24.5±2.7	20.7±2.0	20.7±3.3
Hot carcass weight (kg)	11.3 ± 1.9^{a}	11.0 ± 1.8^{a}	10.9 ± 1.2^{a}	8.9 ± 1.0^{b}	9.0 ± 1.8^{b}
Dressing (%)	46.8±1.9	44.4±1.4	43.9±0.7	43.0±1.2	43.0±1.6
Empty body weight (kg)	21.0 ± 3.3^{a}	18.7 ± 2.2^{b}	19.5 ± 2.3^{b}	17.1 ± 2.0^{c}	16.4 ± 2.7^{c}
Rib eye area (cm^2)	13.5 ± 2.4^{a}	12.2 ± 2.3^{ab}	11.0 ± 1.3^{ab}	7.5 ± 0.6^{b}	10.0 ± 1.1^{ab}

^{abc}Means within rows with same superscript differ (P<0.05).

Key Words: Goat kids, Shrubs, Trees

W120 Effects of method of exposure of crossbred Boer wether goats to Eastern red cedar foliage on cedar consumption. G. Animut*[1,2], A. L. Goetsch[1], R. C. Merkel[1], G. Detweiler[1], L. J. Dawson[3], R. Puchala[1], T. Sahlu[1], and R. E. Estell[4], [1]*E (Kika) de la Garza American Institute for Goat Research, Langston University, Langston, OK,* [2]*Animal Science Department, Oklahoma State University, Stillwater, OK,* [3]*School of Veterinary Medicine, Oklahoma State University, Stillwater, OK,* [4]*USDA ARS Jornada Experimental Range, Las Cruces, NM.*

This study was conducted to determine effects on present and future consumption of Eastern red cedar (*Juniperus virginiana*) foliage (CF) by goats of stepwise increases in dietary level of CF compared with a constant relatively high level and subsequent availability of low-quality forage. Twenty-four yearling wethers (23.5 ± 2.31 kg initial BW) were penned individually in Phases 1 and 3. In Phase 1 (8 wk), a concentrate-based diet (12.6% CP and 35.5% NDF) was offered at approximately

85% of the maintenance energy requirement alone (Control) or with weekly stepwise (Step) increases in substitution of CF for concentrate (0, 1.25, 2.5, 5, 10, 15, 20, and 25% in wk 1-8, respectively; DM basis) or substitution of 25% CF in wk 2-8 (Set). Wethers grazed grass pasture in Phase 2 (6 wk). In Phase 3 (2 wk), all wethers were offered the 75% concentrate, 25% CF diet, without or with separate free-choice offering of prairie hay. CF was harvested weekly from male trees and refrigerated; CF and concentrate were hand-mixed prior to feeding. In Phase 1, average total DMI was similar among treatments. Intake of CF as a percentage of that offered was greater ($P < 0.05$) for Step vs Set in wk 3-8 (wk 3: 86 and 48; wk 4: 89 and 56; wk 5: 94 and 71; wk 6: 96 and 81; wk 7: 93 and 63; wk 8: 96 and 84), although CF intake as g/d was greater ($P > 0.05$) for Set vs Step in all but wk 7 and 8. In Phase 3, concentrate intake was similar among treatments, and hay intake when offered averaged 149, 134, and 124 g/d for Step, Set, and Control, respectively. For wethers not receiving hay, CF intake as g/d for Step was greatest among treatments ($P < 0.05$) but was not different from treatments offered hay (67, 37, 30, 55, 53, and 56 g/d for Step, Set, Control, Step+hay, Set+hay, and Control+hay, respectively; SE = 7.1). Similarly, CF intake as a percentage of offered CF ranked ($P < 0.05$) Step > Set > Control without hay, but was not different between Step without hay and treatments with hay (78, 41, 34, 61, 57, and 60 for Step, Set, Control, Step+hay, Set+hay, and Control+hay, respectively; SE = 7.6). In conclusion, gradual increases in dietary level of CF deserve further research as a potential means of elevating present and future CF consumption, with attention also directed to type and level of other feedstuffs offered.

Key Words: Eastern Red Cedar, Goats, Adaptation

W121 Evaluation of tropical legume forages (*Medicago sativa*, *Dolichos lablab*, *Leucaena leucocephala*, and *Desmanthus virgatus*) for growing goats.

J. Kanani*[1], S. D. Lukefahr[1], and R. L. Stanko[1], [1] *Texas A&M University-Kingsville*.

A feeding trial of 56 d was conducted to evaluate the effect of supplementing with legume forages (*Medicago sativa*, *Dolichos lablab*, *Leucaena leucocephala*, and *Desmanthus virgatus*) on growth and feed performance. Castrated kids (n=24) with an average initial age of 135 d and live-weight of 18.72 kg were used in the study. Kids were of predominantly Boer or Spanish crossbreeds, which were randomized across diet groups. Four diets were composed of *Sorghum bicolor* (sudangrass hay) supplemented by one of four legume hay forages, calculated on a DM basis, and corn (200 g/d per goat). On the basis of 100 g/d gains, each animal was limit fed 0.4 and 0.6 kg of legume to sudangrass each day. A split-plot design was employed, with diets as main plots, and pens as subplots (consisting of 3 pens as replicates per diet). Each pen contained two goats. In addition, for growth traits, data were blocked for the effects of breed-type, litter size, parity of dam, and initial age as a linear covariate. Interactions between main effects were never significant. Initial body weights were the same (20.6 kg) for Boer and Spanish crossbreds ($P>0.05$). Also, Boer compared to Spanish crossbred kids had similar weight gains (4.26 and 4.52 kg; $P=0.719$), although Boer crossbred kids tended to be heavier ($P<0.10$) than Spanish crossbred kids (23.8 and 21.4 kg) at the end of the study. Total body weight gains over the 56-d trial were not significantly influenced by diet (4.61, 4.28, 5.26, and 3.41 kg for alfalfa, lablab, leucaena, and desmanthus, respectively; pooled SE of 0.71). Final body weights (recorded at approx. 9:00 am) were also not affected by diet ($P>0.05$). Voluntary total feed intake was higher by 3.71 kg ($P<0.001$) in pens of two goats receiving the alfalfa control diet compared to the average of pens receiving the experimental legume forage diets (28.3, 25.9, 29.5, and 18.4 kg for alfalfa, lablab, leucaena, and desmanthus, respectively). Intake of lablab compared to desmanthus forage was higher by 7.51 kg ($P<0.001$), demonstrating relatively poorer palatability for desmanthus. Diet tended to influence ($P=0.062$) feed conversion efficiency (ADG/DMI) with diet means of 0.097, 0.100, 0.127, and 0.087 for alfalfa, lablab, leucaena, and desmanthus forages, respectively (pooled SE of 0.0088). In conclusion, our research results did not show significant effects of legume forage diet on growth performance.

Key Words: Goats, Legumes, Tropical agriculture

W122 Cell wall degradability of the diet consumed by grazing goats in North Mexico.

A. S. Juarez-Reyes, R. Montoya-Escalante, G. Nevarez-Carrasco, and M. A. Cerrillo-Soto, *Universidad Juarez del Estado de Durango. Durango. Dgo. Mexico.*.

The degradation characteristics of a feed, particulary rate of degradation and effective degradability, provide an estimate of its rumen digestibility, which to a large extent influences intake and productivity of livestock. However, there is very little information available on degradation characteristics of forage consumed by grazing goats. The aim of this study was to determine the *in situ* degradability of the cell wall content of the diet consumed by grazing goats in a thorn scrubland in North Mxico. Three ruminal and esophageal cannulated goats were used to obtain samples during the 1999 dry season (February-June) and a month (July) of the rainy season . The extrusa samples collected from the previous month were incubated in the rumen of the same animals for 0, 3, 7, 12, 24, 48, 72 and 96 h. The degradation of the cell wall content of the samples was described by using the equation $p = a + b\ (1\text{-}e^{-ct})$. The values obtained for the fractions: (a), soluble fraction, (b) insoluble but fermentable fraction, (a+b) potencial degradability, (c) constant rate of degradation, and (ED) effective degradability were analyzed according to a randomized block experimental design using Proc GLM (SAS). The fractions (a), (b), (c), (a+b) and (ED) differed among months ($P<0.05$). July had higher values for (a), (c), (a+b) and (ED), except for (b) ($P<0.05$), for which March had the highest value (53.6%), indicating shrub regrowth. Results indicated that variations in quality and availability of the forage consumed by grazing goats may be detected by measuring both the rate (c) and the effective degradability (ED).

	Fractions (%)				
Months	a	b	a+b	c	ED
February	0.8^{d}	36.5^{b}	37.3^{cd}	5.0^{ab}	17.6^{bc}
March	1.9^{cd}	53.6^{a}	55.5^{ab}	2.7^{b}	20.4^{bc}
April	8.0^{c}	37.3^{b}	45.4^{bc}	3.8^{ab}	24.3^{b}
May	9.2^{b}	34.7^{b}	44.0^{c}	4.6^{ab}	25.9^{b}
June	-1.3^{d}	33.7^{b}	32.4^{d}	3.6^{ab}	12.8^{c}
July	22.8^{a}	39.6^{b}	62.5^{a}	6.1^{a}	44.6^{a}
Mean	6.9	39.2	46.2	4.3	24.3
SEM	1.7	3.6	2.6	0.0098	2.4

^{a,b,c,d} Means within columns with the same superscript do not significantly differ ($P<0.05$).

Key Words: Goats, Cell wall degradability, Grazing

W123 Effects of different quality diets consumed continuously or after a lower quality diet on characteristics of growth of young Spanish goats.

T. Wuliji, A. L. Goetsch, T. Sahlu*, R. Puchala, S. A. Soto-Navarro, R. C. Merkel, G. Detweiler, and T. A. Gipson, *E (Kika) de la Garza American Institute for Goat Research, Langston University, Langston, OK*.

Spanish wether and doeling kids (n=38; 4.5 mo of age; 13.4 kg initial BW) were used to determine influences of different quality diets consumed continuously or after a lower quality diet on characteristics of growth. The experiment consisted of two 9-wk periods. Diets were low quality forage (L; prairie hay supplemented with soybean meal), high quality forage (H; dehydrated alfalfa pellets), and 70% concentrate (C). Kids on two treatments consumed L in Period 1, with half switched to C and half to H in Period 2 (LC and LH, respectively). The CC treatment entailed C consumption in both periods, and HH kids were fed H in both periods. For HC, H was fed in Period 1 followed by C in Period 2. Dry matter intake ranked ($P < 0.05$) LC and LH < CC < HC and HH in Period 1 (502, 352, 386, 610, and 636 g/d) and CC and LC < LH, HC, and HH in Period 2 (652, 621, 833, 808, and 836 g/day for CC, LC, LH, HC, and HH, respectively). Average daily gain was lowest among treatments ($P < 0.05$) for LC and LH in Period 1 (78, 1, -1, 84, and 80 g) and was 53, 82, 112, 92, and 73 g in Period 2 for CC, LC, LH, HC, and HH, respectively (SE = 11). Empty body fat concentration at the end of Period 1 was greatest for the C diet and lowest for L ($P < 0.05$; 12.2, 6.4, and 9.0% for C, L, and H, respectively), and protein concentration was greatest among treatments ($P < 0.05$) for L (16.8, 20.1, and 18.1% for C, L, and H, respectively). At the end of Period 2, empty body fat concentration was 22.0, 15.9, 14.4, 20.1, and 15.2% (SE = 1.94), and protein concentration was 16.8, 16.9, 17.9, 16.5, and 17.6%

(SE = 0.35) for CC, LC, LH, HC, and HH, respectively). In summary, kids on the L diet in Period 1 mobilized fat to accrete a small amount of protein. Continuous consumption of C resulted in high fat accretion relative to H in both periods. Consumption of H in Period 1 followed by C in Period 2 resulted in growth characteristics slightly different from those with continual intake of C, with a lower concentration of protein in accreted tissue for HC. The diet in Period 2 for kids previously consuming L did not markedly affect tissue accretion. In conclusion, the nature of the diet consumed by young Spanish goats can impact current and subsequent rate and composition of BW gain.

Key Words: Goats, Diet quality, Growth

W124 Effects of diet quality and age of meat goat wethers on early subsequent growth while grazing wheat forage. A. L. Goetsch*, G. Detweiler, T. Sahlu, R. Puchala, R. C. Mekel, and S. A. Soto-Navarro, *E (Kika) de la Garza American Institute for Goat Research, Langston University, Langston, OK.*

Thirty-six meat goat wethers (3/4 Spanish and 1/4 Boer), born in the previous Spring (initial age and BW of 8.5 mo and 17 ± 0.6 kg) or Fall (initial age of 2.5 mo and 13 ± 0.8 kg), were used to determine effects of ad libitum consumption of different quality diets and age on early subsequent growth while grazing wheat forage. The experiment was 14 wk long, with 9 wk in the winter consuming prairie hay (5% CP and 71% NDF) supplemented with 0.125% BW of soybean meal (PH), alfalfa pellets (AP), or a 70% concentrate diet (CD), and 5 wk in the spring grazing wheat forage. Average daily gain in Period 1 (28, 54, and 81 g; SE = 14.0) and Period 2 (123, 137, and 100 g for PH, AP, and CD, respectively; SE = 13.8) was similar among dietary treatments and greater for Spring vs. Fall wethers (Period 1: 72 vs 37 g, $P < 0.05$; Period 2: 131 vs 108 g, $P < 0.09$). There was not a discernible pattern of change in ADG as week of grazing wheat forage advanced (wk 1: 65 and 22 g; wk 2: 236 and 188 g; wk 3: 65 and 105 g; wk 4: 49 and 23 g; wk 5: 249 and 215 g for Spring and Fall, respectively). Body composition (estimated from shrunk BW and urea space) on d 42 and 98 and composition of gain were similar among dietary treatments. Differences between ages ($P < 0.05$) in protein mass on d 42 (2.92 and 2.65 kg for Spring and Fall, respectively) and 98 (3.72 and 3.36 kg for Spring and Fall, respectively) were similar in magnitude, although that in fat mass on d 98 (4.60 and 3.31 kg) was considerably greater than on d 42 (2.39 and 1.96 kg for Spring and Fall, respectively). In accordance, protein accretion from d 42 to 98 was similar between ages (14.3 and 12.6 g/d for Spring and Fall, respectively; SE = 0.86), whereas rate of fat accretion was greater ($P < 0.05$) for Spring vs Fall wethers (39.6 vs 24.1 g/d). In conclusion, the nature of the diet consumed ad libitum did not impact subsequent growth by 3/4 Spanish wethers, regardless of age, when grazing wheat forage.

Key Words: Goats, Age, Wheat forage

W125 Spatial-temporal relationships of grazing goats and sheep and their guardian dog monitored by global positioning system collars. T.A. Gipson*, M. Villaquiran, J. Joseph, and A. L. Goetsch, *E (Kika) de la Garza American Institute for Goat Research, Langston University, Langston, OK.*

Guardian animals such as dogs, donkeys, and llamas are commonly used to protect small ruminants from predators. However, data on their spatial relationships are lacking. The objectives of this research were to examine spatial relationships of goats (G), sheep (S), and guard dogs (D) over time and to determine circadian rhythms. In a group of 12 G and 12 S confined in a 1.6 ha pasture, Global Positioning System (GPS) collars were fitted to three G, two S, and the sole D. GPS fixed longitude and latitude every 30 min for 2 wk. After post-differential correction, minimum distance traveled between consecutive fixes (4,097 observations) and distance between any two animals at the same fix time (7,097 observations) were calculated using spherical geometry. The repeated measures, mixed model included animal identity, species, and fix time, with identity nested within species as a random effect. At night, S traveled least between fixes (17.2 ± 1.30 m) and D most (21.9 ± 1.94 m) with G intermediate (17.6 ± 1.10 m). However, during day, D traveled least (29.0 ± 1.64 m) and G most (48.3 ± 0.87 m) with S intermediate (41.0 ± 1.02 m). For distances among species at the same fix, closest distance was at night among G (11.2 ± 1.21 m) and greatest distance at night between the D and S (93.0 ± 1.45 m), which was not different ($P>.10$) from the distance during day between D and S (91.5 ± 1.21 m) or distance at night between G and S (90.2 ± 0.81 m). Distance among G was greater ($P<.05$) during day (14.8 ± 1.01 m) than at night (11.2 ± 1.21 m). Distance between S was greater ($P<.01$) during day (28.6 ± 1.40 m) than at night (14.1 ± 1.80 m). Distance between G and D during day was 52.6 ± 1.04 m and at night was 17.5 ± 1.21 m. During day distance between G and S was 66.9 ± 0.66 m. The three species exhibited definite spatial relationships and preferences; however, further study is needed to ascertain causal effects for these preferences.

Key Words: Goats, Sheep, GPS

W126 Global positioning system for monitoring spatial relationships of grazing goats within and across pastures. M. Villaquiran*, T. A. Gipson, J. Joseph, and A. L. Goetsch, *E (Kika) de la Garza American Institute for Goat Research, Langston University, Langston, OK.*

Herd dynamics for goats are not as well understood as for other grazing species, especially how differing genotypes affect spatial aspects or how herds in adjacent pastures interact spatially. The objective of this study was to investigate spatial relationships in a herd of mixed genotype goats. In one 2-ha pasture (East, E) containing 30 Angora (A) and Boer-cross (B) goats, global positioning system (GPS) collars were fitted to one A, two B, and their guard dog (D). In the adjacent 2-ha pasture (West, W) also containing 30 A and B, GPS were fitted to one A and one B. GPS fixed longitude and latitude every 30 min for 2 wk. D had access to both pastures. After post-differential correction, minimum distance traveled between consecutive fixes (3,922 observations) and distance between any two animals at the same fix time (4,265 observations) were calculated using spherical geometry. The repeated measures, mixed model included animal identity, genotype, pasture location, and fix time with identity nested within genotype as a random effect. During the day D (60.9 +/- 2.32 m) traveled more ($P < 0.01$) than goats (A: 36.4 +/- 1.58 m; B: 36.9 +/- 1.26 m, respectively). At night, A, B, and D traveled less ($P < 0.05$) during day (22.5 +/- 2.07, 18.3 +/- 1.67 and 21.7 +/- 2.85 m, respectively). Within pasture, A-B goat distance (19.9 +/- 3.91 m) was not different from the B-B distance (12.7 +/- 6.79 m). During day, distance among goats was 21.5 +/- 3.55 m and 16.6 +/- 3.54 m at night. Distances of D with goats in W were greatest ($P < 0.01$) during day (100.7 +/- 2.17 m) and least at night (75.1 +/- 2.08 m) and distances of D with goats in E were greatest ($P < 0.05$) during day (40.4 +/- 1.98 m) and least at night (35.2 +/- 1.82 m). Genotype of goat did not affect spatial relationships; however, time of day did, with distance traveled and distance between animals greater during day than at night.

Key Words: Goats, Dog, GPS

Physiology

W127 Metabolizable protein requirements for maintenance, gain, and mohair fiber growth by Angora goats. J. Luo*, A. L. Goetsch, and T. Sahlu, *E (Kika) de la Garza American Institute for Goat Research, Langston University, Langston, OK.*

A database of treatment mean observations from the literature was constructed for Angora goats to estimate metabolizable protein (MP) requirements for maintenance, gain, and mohair fiber growth. Observations were categorized as preweaning, growing, mature (not lactating or pregnant), lactating, and pregnant goats; however, due to limited numbers of observations, data for preweaning, lactating, and pregnant goats were removed. Intake of MP (MPI) was estimated from feed intake, diet composition, and protein degradability properties with methods similar to those of AFRC. Data set 1 (n = 124) was used to determine MP requirements for maintenance and whole body gain (i.e., ADG; tissue and fiber) by simple linear regression; data set 2 (n = 88) was employed to estimate MP requirements for maintenance, tissue gain, and mohair fiber growth by multiple regression. Variables, scaled by kg $BW^{0.75}$, were MPI (g/d), ADG (g), non-fiber, tissue gain (TG; g/d), and clean fleece growth rate (CFGR, g/d). Because there were no differences (P