

% the requirements of drinking water for feedlot cattle, without affect negatively impacting performance or carcass quality.

Key Words: Corn Silage, Drinking Water, Feedlot Cattle

W159 The effect of different types of morphologically abnormal spermatozoa on bovine embryo development after IVF. A. H. Walters*¹, W. E. Eyestone², R. G. Saacke¹, R. E. Pearson¹, and F. C. Gwazdauskas¹, ¹Virginia Polytechnic Institute and State University, Department of Dairy Science, Blacksburg, ²Virginia Polytechnic Institute and State University, Department of Large Animal Clinical Science, Blacksburg.

The study was conducted to evaluate the effect of semen samples collected from bulls subjected to scrotal insulation on embryonic development after in vitro fertilization (IVF). Morphologically abnormal semen samples from four Holstein bulls were cryopreserved following a scrotal insulation period of 48 h (d 0). Three types of semen samples were used for IVF: 1) semen from bulls collected 5 d prior to scrotal insulation (Pre-insult); 2) semen from d 13 (2 wk-PI); and 3) d 20 (3 wk-PI) post-insult. Following an 18 h sperm-oocyte co-incubation, embryos

were cultured for 8 d and evaluated. The post-thawed morphological evaluation of semen revealed a decrease ($P < 0.01$) in the percentages of normal spermatozoa in the post insult samples (3 wk-PI) compared with the Pre-insult samples for Bulls I and Bull III ($74 \pm 2.4\%$ to $22.3 \pm 2.4\%$ and $67.7 \pm 2.4\%$ to $0.5 \pm 2.4\%$, respectively), while the percentage vacuolated spermatozoa increased significantly for Bull II (diadem-0% to $59.6 \pm 2.0\%$; apical vacuoles- $1.06 \pm 3.6\%$ to $47.8 \pm 3.6\%$). There was no change in abnormal sperm population for Bull IV ($<10\%$). The cleavage and blastocyst formation rates and embryo development scores were affected ($P < 0.01$) by the interaction of bull by sample collection time. For Bull I and Bull III (severe responders) there was a decreased rate of cleavage ($77.9 \pm 1.9\%$ to $62.7 \pm 1.7\%$ and $85.5 \pm 1.7\%$ to $66.3 \pm 1.5\%$) and blastocyst formation ($23.4 \pm 1.9\%$ to $10.6 \pm 1.7\%$ and $26.8 \pm 1.7\%$ to $13.5 \pm 1.6\%$) decreased between the Pre-insult and 3 wk-PI samples. In contrast, the cleavage and blastocyst formation rates for Bull II ($71.6 \pm 1.4\%$ and $16.9 \pm 1.5\%$) and Bull IV ($77.8 \pm 1.7\%$ and $21.4 \pm 1.5\%$) were unaffected. In conclusion, a decrease in embryonic development seems to be related to the changes in head shape morphology.

Key Words: Abnormal Spermatozoa,, Scrotal Insult, IVF

Goat Species

W160 Replacement of alfalfa neutral detergent fiber with a combination of nonforage fiber sources on ruminal pH and performance in Alpine goats raised under natural conditions in northern Mexico. P. A. Robles-Trillo*¹, L. Garcia-Palestina¹, E. De Lazaro-Urbina¹, R. Rodriguez-Martinez¹, and R. Bañuelos-Valenzuela², ¹Universidad Autonoma Agraria Antonio Narro Unidad Laguna, Santa-Fe, Torreon, Mexico, ²Unidad Academica de Medicina Veterinaria y Zootecnia, UAZ, Victor Rosales, Mexico.

There has been a limited number of studies carried out on goats about the physiological and productive consequences when NDF is replaced with nonforage fiber sources (NFFS). To evaluate the effect of replacing NDF from alfalfa with NFFS combination (whole linted cottonseed, soy hulls, and wheat bran) on ruminal pH, ADG, dry matter intake (DMI), and feed efficiency (FE), sixteen Alpine goats (body weight of 22.81 ± 1.84 and 7 months old) were used in a 4×4 block design. The four diets were basal control diet (LAD) low in forage and fiber (9.27% of alfalfa NDF and 6.72% of corn silage NDF, DM basis), a normal forage diet high in alfalfa (HAD) (LAD diet, plus 14% of alfalfa NDF), and two low forage diets with either 9.4% NDF (LNFD) or 18.18% (HFND) NDF DM basis from the NFFS combination. Ruminal samples were obtained by stomach tube each 3 h by seven times daily to determinate the pH ruminal content by a potentiometer. DMI and FE were calculated by body weight and weight gain daily. The effects of treatments upon pH, ADG, DMI, and FE were evaluated and analyzed by means of ANOVA. Our results showed an effect of treatment ($P < 0.001$) on ruminal pH, which was highest for the HAD treatment and lowest for LAD, without differences between LNFD and HFND. A difference in ADG ($P < 0.05$) was found between LAD and HAD, but values were similar between LNFD and HFND. There were no differences ($P > 0.05$) in DMI. FE was greater ($P < 0.05$) for LAD vs HAD. The replacement of NDF from alfalfa with NFFS did not reduce ruminal pH with respect to the normal forage diet (LAD) and therefore, ruminal function could have remained normal. However, NFFS had a detrimental effect on ADG and FE without affecting DMI, which could be important to economic profitability depending on cost of NFFS products.

Least square means for ruminal pH (pH), average daily gain (ADG), dry matter intake (DMI), and feed efficiency (FE) in goats (N=16) with four different diets (LAD, LNFD, HFND, and HAD) in Northern Mexico (25° NL)

Variables	Treatments				S.E.M.
	LAD	LNFD	HFND	HAD	
pH	6.13 ^a	6.19 ^a	6.26 ^b	6.33 ^c	0.02
ADG	0.089 ^a	0.060 ^{ab}	0.065 ^{ab}	0.043 ^b	0.01
DMI	47.03 ^a	45.21 ^a	46.71 ^a	44.31 ^a	1.62
FE	0.11 ^b	0.08 ^{ab}	0.08 ^{ab}	0.06 ^a	0.01

^{a,b,c}Means within a row with unlike superscriptors are different ($P < 0.05$)

Key Words: NDF, Nonforage Fiber Sources, Goat Performance

W161 Influence of diet and gut fill on blood metabolites and fecal shedding of *E. coli* in sheep and goats. V. R. Gutta*, G. Kannan, B. Kouakou, K. M. Gadiyaram, W. R. Getz, G. W. McCommon, and Y. Lan, Fort Valley State University, GA.

Recent reports have shown that fecal shedding of *Escherichia coli* can be reduced by preharvest management practices in small ruminants. The objectives of this experiment were to determine the effects of diet and feed deprivation time prior to harvesting on fecal *E. coli* shedding and blood metabolite concentrations in sheep and goats. In an RCBD split-plot design, sheep (wethers, $n = 16$) and goats (bucks, $n = 16$) were assigned to 8 pens (4 sheep or goats/pen) and fed either a concentrate diet or a hay diet for four days. The animals (8 - 12 mo of age) were then taken to the processing facility and subjected to either 12 or 24 h feed deprivation prior to harvesting, with continuous access to water. Sterile sponges were used to sample (5×5 cm area) hind legs of each animal for *E. coli* contamination before and after feed deprivation. Blood samples were also collected to determine urea nitrogen (BUN) and glucose levels prior to harvesting. Generic *E. coli* counts in the rumen were higher ($P < 0.01$) in animals subjected to 24 h feed deprivation than those subjected to 12 h feed deprivation. *E. coli* counts in the rectum were higher ($P < 0.01$) in concentrate-fed than in hay-fed animals. *E. coli* contamination of hair/fleece was higher ($P < 0.05$) in sheep than in goats. Behavioral observations during holding revealed that sheep spent more time lying down than goats, indicating that sheep are more prone for fecal contamination from the pen floor during preharvest holding than goats. The pH values of rumen and colon contents were higher ($P < 0.01$) in hay-fed animals than concentrate-fed animals. Glucose and BUN concentrations were not influenced by diet or feed deprivation. Fecal contamination in sheep and goats can be controlled by preharvest dietary management, with no significant changes in glucose and BUN levels. The results indicate that hay feeding and shorter feed deprivation period decrease *E. coli* counts. Sheep may be more prone for fecal contamination during holding.

Key Words: Sheep and Goats, *E. Coli*, Fecal Contamination

W162 Effect of different levels of food and water deprivation on serum levels of catecholamines, glucose, and creatinine in Mexican-native goats. C Meza, RM Rincon, R Bañuelos, F Echavarría, and CF Arechiga*, *Universidad Autónoma de Zacatecas, Mexico*.

Level of stress by food and water deprivation was evaluated on Mexican native goats by determination of serum catecholamines, glucose, and creatinine. Goats ($n=12$ and weight 29.5 ± 2.0 kg) from north-central Mexico ($23^{\circ} 00'$ latitude N and $102^{\circ} 30'$ longitude W at 2,150 m above sea level), were randomly assigned into 4 groups: FWD 0 = Control, without food and water deprivation (fed daily ad libitum); FWD 1 = food and water deprivation of 1 d (fed every day just for 2 h); FWD 2 = food and water deprivation of 2 d (fed every 2 d just for 2 h); and FWD 3 = food and water deprivation of 3 d (fed every 3 d just for 2 h). The experiment was conducted from November through April (autumn-winter). Every month, during the 4th wk, each goat was bled in order to obtain nine blood samples at different 15-min intervals before and after food and water were given (-45, -30, -15, 0, 15, 30, 45 min). Serum samples of glucose and creatinine were analyzed by spectrophotometry while catecholamines were determined by fluorometric techniques. The average serum concentration was 19.21 mg/dL for catecholamines, 57.22 mg/dL for glucose, and 2.74 mg/dL for creatinine. Food and water deprivation affected serum glucose concentration ($P < 0.05$) without affecting creatinine or catecholamines. In contrast, month of gestation affected ($P < 0.05$) all three variables. In fact, while serum catecholamines levels were intermediate at the beginning of the gestation, they decreased towards the intermediate gestation, and were highest at the end of the gestation. A positive correlation was observed between glucose and creatinine suggesting a possible catabolic scenario in muscular tissue followed by an increased level of hepatic gluconeogenesis. Even though nutritional and hydric stress affected glucose serum levels, this metabolic restriction did not compromise embryonic and fetal development as well as kidding percentage, suggesting a high degree of adaptation of Mexican-native goats to face stress by food and water deprivation.

Key Words: Goats, Catecholamines, Food Scarcity

W163 Effect of buck presence on frequency, amplitude, and concentration of luteinizing hormone (LH) in Mexican-native goats exposed to artificial photoperiod. R. M. Rincon*, C. F. Arechiga¹, F. J. Escobar¹, M. A. Lopez¹, and J. Valencia², ¹*Universidad Autónoma de Zacatecas, Mexico*, ²*Universidad Nacional Autónoma de México*.

The purpose of present work was to evaluate the effect of introducing a sexually-active male buck on LH pulse frequency, amplitude, and concentration in Mexican-native goats exposed to a 6-month long artificial photoperiod. Female goats ($n=30$) were either exposed to the presence or absence of a male buck ($n=15$ /group). Within each group, there were Control (CON, $n=5$), Ovariectomized (OVX, $n=5$), and Ovariectomized + Estradiol-implanted goats (OVX + E2X, $n=5$). All female goats were exposed to a 6-month long artificial photoperiod ranging from 10.6 to 13.4 h of light during the day (short and long days). Blood samples were obtained during short and long days for sampling periods of 6 hours every 15 min. Progesterone and LH levels were determined by RIA. Presence of a male buck increased ovarian activity of native goats. LH frequency, amplitude, and concentration were higher ($P < 0.001$) in response to male buck presence (frequency = 3.13 vs 1.34 pulses/6 h; amplitude = 1.50 vs. 0.96 ng/mL; concentration = 4.61 vs 2.70 ng/mL). Progesterone concentrations were also higher in response to male buck presence (4.04 vs 2.20 ng/mL). Presence of a male buck maintained LH pulse frequency and concentration elevated in goats despite being exposed to an inhibitory photoperiod. In conclusion, male-buck presence influence reproductive activity of Mexican-native goats in north-central Mexico.

Key Words: Goats, Luteinizing Hormone, Photoperiod

W164 Mineral content of diets selected by range criollo goats in a poor condition shrubland of north Mexico. M. A. Cerrillo-Soto*, G. Nevarez-Carrasco, R. Montoya-Escalante, and A. S. Juárez-Reyes, *Universidad Juárez del Estado de Durango, Dgo, Mexico*.

The study was conducted to determine the mineral content in diets selected by goats grazing a poor condition shrubland in a semi-arid region of north Mexico. The study area is located at $24^{\circ} 04'$ N, $103^{\circ} 23'$ W, altitude of 1,435 m, annual mean temperature is 17° C and rainfall is about 278 mm. Six nonlactating female goats (30 ± 4.9 kg BW) fitted with esophageal cannulae were used to collect monthly extrusa samples. The sampling was performed in October, December, January, March, April, May, June, July, and September. Animals were sampled two days each month at 1130 and 1530 for 45 min. The samples were composited, dried, and ground (1 mm). Ca, Mg, K, Na, Co, Cu, Mn, Fe, and Zn determinations were performed by atomic absorption spectrophotometry. Phosphorus was determined by colorimetry. Data were statistically analyzed for a completely randomized design. Macro mineral concentrations of the forage selected by goats varied ($P < 0.05$) among months. Calcium content ranged from 8.2 to 28.8 g/kg (mean = 16.0 g/kg). Content of P ranged from 1.1 to 3.5 g/kg (mean = 2.3). Dietary Mg ranged from 1.7 to 3.3 g/kg (mean = 2.2 g/kg). Potassium content ranged from 9.7 to 21.7 g/kg (mean = 16.1 g/kg). Mean concentration of Na was 3.87 g/kg and varied from 3.4 to 4.3 g/kg. Magnesium concentration ranged from 1.5 to 3.3 g/kg (mean = 2.2 g/kg). Trace minerals concentrations also varied ($P < 0.05$). The Co content varied from 13.2 to 19.4 mg/kg (mean = 14.7 mg/kg). Concerning Cu, concentration ranged from 6.7 to 11.6 mg/kg (mean = 8.4 g/kg). Concentration of Mn ranged from 27.1 to 99.1 mg/kg (mean = 54.2 mg/kg). Zinc concentration ranged from 19.6 to 81.0 mg/kg (mean = 30.4 mg/kg). Iron content varied from 96.1 to 708.2 mg/kg (mean = 350.8 mg/kg). Results suggest that P, Na, Cu, and Zn contents do not satisfy goat requirements; thus, a supplementation program should be implemented.

Key Words: Minerals, Grazing, Goats

W165 Mineral content of forage selected by goats grazing an oak shrubland in north Mexico. M. A. Cerrillo-Soto*, G. Nevarez-Carrasco, R. Montoya-Escalante, and A. S. Juárez-Reyes, *Universidad Juárez del Estado de Durango, Dgo, Mexico*.

A study was conducted to estimate the mineral content of the diet selected by goats grazing an oak shrubland in the central region of Durango, Mexico. The study area is located at the $24^{\circ} 32'$ N and $104^{\circ} 28'$ W at 2340 m. The climate is semi-arid with a mean annual rainfall of 376 mm and temperature of 16° C. Six adult female Spanish criollo goats (35 ± 5 kg BW) were used to obtain samples according to the hand-plucked method. The samples were collected monthly for two days, morning and evening, for a period of twelve months. Mineral concentrations of Ca, Mg, K, Na, Cu, Mn, Fe, and Zn in monthly diets were determined using an atomic absorption spectrophotometer. Phosphorus concentrations were determined by colorimetry. Data were analyzed for a completely randomized design. Macro mineral concentrations of the forage selected by goats varied ($P < 0.05$) among months. Sodium content ranged from 0.17 to 0.33 g/kg with a mean of 0.23 g/kg. Dietary Ca ranged from 4.6 to 17.8 g/kg, with an annual mean of 12.7 g/kg. Phosphorus content ranged from 0.73 to 1.80 g/kg, and the mean was 1.1 g/kg. Annual mean concentration of Mg was 3.1 g/kg and the concentration varied from 1.8 to 4.7 g/kg. Potassium concentration in the forage selected by goats ranged from 8.2 to 16.7 g/kg, with a mean of 12.6 g/kg. Forage concentrations of trace minerals also varied ($P < 0.05$) among months except for Zn. Copper concentration ranged from 4.3 to 9.0 mg/kg (mean = 6.5 g/kg). Concentration of Mn ranged from 69.1 to 276.3 mg/kg (mean = 176.1 mg/kg). Concerning Fe, the concentration ranged from 29.9 to 136.2 mg/kg (mean = 65.8 mg/kg). Finally, Zn content did not differ among months ($P > 0.05$; mean = 59.9 g/kg). Data indicated that contents of Ca, K, and Mg in all months are adequate to meet the requirements of adult range goats for maintenance, pregnancy, and lactation. Moreover, Mn, Zn, and Fe contents also meet the requirements. However, Na, P, and Cu concentrations in the diet are below requirements. Thus, a supplementation schedule for these minerals should be implemented throughout the year to maintain productivity of goats.

Key Words: Minerals, Goats, Grazing

W166 Silymarin administration to transition dairy goats: effects on liver tissue and plasma metabolites. D. Tedesco*¹, S. Galletti¹, D. Olivero², M. Tameni¹, and S. Rossetti¹, ¹Department of Veterinary Sciences and Technologies for Food Safety, Milan, Italy, ²BiEsseA, Milan, Italy.

The fatty liver syndrome frequently develops in dairy cows in the transition period between late pregnancy and early lactation. Little is known about this condition in dairy goats. Silymarin, a standardized extract from seeds of *Silybum marianum* L. (Gaertn) (milk thistle), is used in human for the treatment of liver diseases of different aetiologies. The aim of the present study was to determine the silymarin effects on liver tissue and haematic parameters of lipid metabolism in transition dairy goats. A total of 24 dairy goats in their second pregnancy were divided into two groups according to body condition score (BCS), health condition, and previous milk production. From 5 d prior to the expected kidding date to 15 d postpartum, the treated goats received 10 mL/d of silymarin as a water suspension, administered as oral drenches. Blood samples were collected from the jugular vein at -5, 0, and 14 d from kidding. Non-esterified fatty acids (NEFA) and β -hydroxybutyrate (BHBA) concentrations in plasma were measured. Liver biopsies were performed 7 d after parturition and liver samples were immediately frozen at -196°C in liquid nitrogen. Samples were sectioned at 3 μ with a cryostat. The sections were then stained with haematoxylin-eosin and osmium tetroxide. This specific method indicates lipid accumulation. Plasma concentrations of NEFA and BHBA were unaffected by treatment. Histological examinations showed fat accumulation in livers of control goats. This accumulation is black stained with the special method used. No fat accumulation was observed in silymarin treated goats. We conclude that treatment with silymarin extract in the peripartum period completely prevented fat accumulation in dairy goats. Silymarin was kindly granted by Indena S.p.A.

Key Words: Silymarin, Dairy Goats, Liver Tissue

W167 Assay of antibiotic residues in goat milk. M. Bsharat* and R. Attaie, *Prairie View A&M University, TX.*

Ten milking goats, 5 Nubians and 5 Alpines, were randomly selected from the milking herd of the International Goat Research Center at Prairie View A&M University. The objective was to determine the residual amounts of tetracycline in the milk of treated goats. It was essential to determine the safe withdrawal period of tetracycline in goat milk using screening tests such as the Charm ROSA Tetracycline and the SNAP Tetracycline tests. The results of these screening tests were compared with a quantitative procedure that was developed for determination of tetracycline residues in milk using a HPLC technique. Milk samples containing antibiotic residues were deproteinized by HCl and acetonitrile and then extracted. The concentrated extracts were filtered before injection into reversed-phase HPLC using an isocratic procedure. For analysis, a Wakosil II C18 column was used with a mobile phase of 0.02 M H₃PO₄ and 0.01 M Na decansulfonate-acetonitrile (65+35) using UV detection at 380 nm. The Charm Rosa test was able to detect the residues up to 96 hours after administration of drug and then gave doubtful results. The SNAP Tetracycline test was able to detect the residues up to 110 hours after injection, showing higher sensitivity. However, the HPLC procedure determined the tetracycline residues in goat milk at levels less than the tolerance limit of 300 ppb after 72 hours of drug administration.

Key Words: Goat Milk, Antibiotic, Residues

W168 Evaluation of Mimosa (*Albizia julibrissin*) and Leucaena (*Leucaena leucocephala*) as feeds for goats. J. Q. Bing* and R. N. Corley III, *Tuskegee University, AL.*

A study was conducted to determine the potential of mimosa (*Albizia julibrissin*) and leucaena (*Leucaena leucocephala*) as feeds for goats. Mimosa and leucaena were harvested in Tuskegee, Alabama in the fall of 2003 and compared with alfalfa hay. Proximate analysis and measurements of NDF, ADF, Ca, K, and Mg were determined. Three non-lactating Nubian female goats fitted with permanent ruminal cannulas were used in a randomized complete block design to determine the kinetics of ruminal digestion. For alfalfa hay, mimosa, and leucaena, respectively, values for dry matter (92.65, 96.88, and 97.42%), crude protein (24.38, 13.31, and 17.81%), NDF (29.00, 53.00, and 36.00%), ADF (24.00, 37.00, and 29.00%), Ca (1.73, 0.62, and 0.80%), K (1.99,

0.85, and 1.20%), and Mg (0.30, 0.26, and 0.35%) were comparable. Ruminal digestion kinetics of alfalfa hay, mimosa, and leucaena, respectively, estimated that 34, 26, and 24% was soluble, 46, 55, and 29% was potentially degradable, 20, 19, and 47% was indigestible, and that the fractional rate of digestion was 0.10, 0.07 and 0.03h⁻¹. Alfalfa hay had a higher (P<0.05) soluble fraction than mimosa or leucaena, which did not differ (P>0.05) from each other. Mimosa had a larger (P<0.05) degradable fraction than alfalfa hay, which was more digestible (P<0.05) than leucaena. Mimosa and alfalfa hay, which did not differ (P>0.05), had lower (P<0.05) indigestible fractions than leucaena. Alfalfa hay had the highest (P<0.05) fractional rate of digestion, followed by mimosa, which was higher (P<0.05) than leucaena. As a whole, chemical composition and digestibility characteristics of mimosa appeared comparable to alfalfa hay, which shows its potential as a feed for goats. Further study is needed to determine the effects of mimosa on ruminal fermentation and animal performance.

Key Words: Leucaena (*Leucaena Leucocephala*), Mimosa (*Albizia Julibrissin*), Goats

W169 Evaluation of *Albizia julibrissin* (mimosa) for internal parasite control in goats. C. Hopkins-Shoemaker*¹, S. Solaiman², B. Blagburn¹, D. Bransby¹, and C. Kerth¹, ¹Auburn University, AL, ²Tuskegee University, AL.

Anecdotal information in the literature suggests that *Albizia julibrissin* (mimosa) may have anthelmintic properties, and parasite control is a major management concern in the southeastern U.S., especially for goats. This experiment was conducted to determine the effect of mimosa fed to goats, with experimentally induced *Haemonchus contortus* larvae, on parasite burden and selected blood parameters. Eighteen Boer cross goat kids (BW \pm 0.07 kg) were housed in individual pens and randomly assigned to two dietary treatments: 1) 90% fresh cut mimosa with 10% alfalfa hay (MA), as fed, and 2) a control treatment of 85% green chop soybeans with 15% of bermudagrass hay (SB), as fed. Dietary treatments were calculated to be isonitrogenous on a DM basis. Feed intake and refusals were monitored daily and feed offered was adjusted weekly for 4 wk. Body weight was recorded weekly after a 4 h withdrawal from water and feed. Fresh feces were collected from each goat weekly and fecal egg counts were conducted using a modified McMaster method. Blood samples were collected weekly, via the jugular vein, and were analyzed for pack cell volume and plasma protein. Dry matter intake was higher (P < 0.01) for animals fed MA (344 and 305 g/d, SE \pm 11, for MA and SB, respectively). Total egg count did not drop based on Kruskal-Wallis and Mann-Whitney tests during the 4 wk experimental period. Initial fecal egg counts were 5,522 \pm 2,317 and 4,555 \pm 1,385, and final egg counts were 8,878 \pm 3,155 and 8,800 \pm 1,234, for treatment groups MA and SB, respectively. Pack cell volume and plasma protein showed no difference (P > 0.10) between dietary treatments or over time. These results indicated that short-term treatment of goats with mimosa was not effective in eliminating or managing *Haemonchus contortus* under controlled feeding conditions. However, long term feeding of mimosa under field conditions may have benefits as a parasite management tool because it allows the animal to browse rather than graze.

Key Words: Mimosa, Parasites, Goat Kids

W170 The use of crawfish meal waste as a protein source for feeding goats. S. Gebrelul*, C. R. Walker, A. Harris, and A. Dantzler, *Southern University and A&M College, Baton Rouge, LA.*

The cost of feed, especially protein sources, represents the single greatest expense (65-80%) of livestock operations. One alternative protein source for goats is crawfish meal as a substitute for soybean meal. In Louisiana, approximately 15 million tons of crawfish are consumed annually. Only 15 percent of the crawfish is edible and the rest is waste. The purpose of this study was to evaluate the growth performance of weaned kids fed crawfish meal. In a completely randomized design, 20 kids were randomly assigned to four treatment groups. The first group served as a control and was fed a concentrate ration that contained 75% corn, 20% soybean meal, and 5% molasses. Fifty, 75, and 100 percent of the protein source (soybean meal) in the control ration was substituted by crawfish meal for the second, third, and fourth groups, respectively. After an adjustment period of two weeks, kids remained in the experiment for six weeks. Initial and final weights, weekly weights, and group

feed consumption were recorded. Data were analyzed by ANOVA where feeding treatment was fitted as main effect. The average weights at the end of the sixth week for the four groups were, respectively, 15.9, 16.2, 16.7, and 13.8 kg ($P > 0.05$). Feed consumption per week averaged 5.6, 3.5, 3.5, and 2.3 kg. Kids in the control and 50% substitution treatment groups grew faster (62.8 and 41.1 g/day, respectively; $P < 0.05$) than kids in the 75 and 100% substitution groups (17.3 and 8.7 g/day, respectively). From these preliminary data, soybean meal in goat rations can be substituted by crawfish meal up to 50 percent. More detailed studies with more animal numbers are needed to determine the effects of crawfish meal as a true protein substitute in goat rations as well as the quality and acceptability of carcasses produced from goats fed crawfish meal.

Key Words: Crawfish Meal, Goats, Soybean Meal

W171 Evaluation of three novel anthelmintics to control internal parasites in female Boer goats. R. Franco*¹, M. Worku¹, J. Miller², D. Libby¹, T. Hanner¹, and P. Matterson¹, ¹North Carolina Agricultural and Technical State University, Greensboro, ²Louisiana State University, Baton Rouge.

The effect of neem (*Azadirachta indica*), wormwood (*Artemisia absinthium*), and tobacco (*Nicotiana tabacum*)+copper sulfate (CuSO_4) or no treatment on packed cell volume(PCV), body weight (BW), fecal egg count (FEC), total white blood cell counts (TWBCC), and white blood cell differential counts (WBCDC) were studied in goats infected with internal parasites. Twenty female Boer goats weighing approximately 40 kg were randomly assigned to four treatments (5 animals each). Goats were drenched with 250 ml of a crude water extract adjusted for protein concentration. Differences were observed between BW of the control group (38.2 kg) and that of the tobacco+ CuSO_4 group (42.9 kg) ($P \leq 0.019$). The control group had a higher PCV (25.5%) compared to neem (21.7%), wormwood (19.4%), and tobacco+ CuSO_4 treatments (20.4%) ($P \leq 0.002$). TWBCC and FEC analysis showed no differences between any of the treatments ($P \leq 0.941$ and $P \leq 0.832$ respectively). Neem treatment significantly reduced the percentage of neutrophils compared to control and wormwood ($P \leq 0.017$). The lymphocyte count was lower for the wormwood treatment (41.2%) compared to the control (52.43%), neem (51.15%), and tobacco+ CuSO_4 treatments (49.35%) ($P \leq 0.012$). BW was positively correlated with monocyte counts ($r = 0.616$, $P \leq 0.0189$) only. PCV had a negative correlation with FEC ($r = -0.744$, $P \leq 0.0023$), TWBC ($r = -0.769$, $P \leq 0.0013$), and eosinophil counts ($r = -0.736$, $P \leq 0.0026$). High FEC, TWBCC, and eosinophil counts were observed when low PCV values were recorded. FEC correlated positively with eosinophil counts ($r = 0.575$, $P \leq 0.031$). TWBCC correlated positively with monocyte counts ($r = 0.581$, $P \leq 0.029$) and eosinophil counts ($r = 0.599$, $P \leq 0.023$). These correlations existed even though none of the variables were significantly different among treatments. Neutrophil and lymphocyte counts were negatively correlated ($r = -0.92$, $P \leq 0.0001$). A progressive decline in the percentage of neutrophils was observed following neem treatment.

Key Words: Anthelmintics, Goats, Neem

W172 Evaluation of diatomaceous earth as a component of goat production practices. C. Bernard*, M. Worku, P. Matterson, D. Libby, T. Hanner, and M. Ahmedna, North Carolina Agricultural and Technical State University, Greensboro.

Diatomaceous Earth (DE) is a natural insecticide that has been promoted as an alternative anthelmintic with potential production advantages. This study evaluated the effectiveness of DE in goat production. Twenty-two naturally infected South African Boer, Spanish, and Spanish/Boer crosses were grouped by weight and parasite burden. Animals were drenched with 150 mL of distilled water containing 3.54 (Group 1), 5.31 (Group 2), 1.77 (Group 3), or 0 g of DE (untreated control). Observations were made over 6 wk. Fecal egg counts (FEC) were conducted using the modified McMasters' technique. Packed cell volume (PCV) and white (WBC) and red blood cell (RBC) counts and weights were recorded. Data were analyzed using SAS. Highly significant differences ($P < 0.0001$) in PCV, FEC, and weekly WBC and RBC counts and weights were observed between treated and control groups. Group 1 had an increase in FEC during the experiment of 2,230 eggs/g (63%); Groups 2, 3, and 4 had increases of 1,852 (32%), 3,199 (64%), and 1,833 eggs/g (70.1%), respectively. Each group demonstrated significant increases in PCV during the experiment except for untreated controls

(Group 1: 25.2 to 28.0%; Group 2: 22.6 to 25.8%; Group 3: 21.4 to 22.5%; control: 27.9 to 24.5%). Group 2 produced the largest increase in PCV compared with the pretreatment level. Week of the experiment had a highly significant ($P < 0.0001$) effect on RBC and WBC counts. Each group exhibited increases in WBC and decreases in RBC counts over the course of the study. Change in BW during the experiment differed among treatments ($P < 0.0001$; -0.44, +0.30, -11.60, and -0.79 kg for Groups 1, 2, 3, and 4, respectively). In summary, an anthelmintic effect of DE was not observed; however, a dose dependent improvement in PCV was noted.

Key Words: Goat, Alternative Therapy, Production

W173 Effect of two levels of energy supplementation on forage intake, growth, and blood parameters in Boer and Kiko-sired crossbred kids. S. Wildeus¹, K. E. Turner*², and J. R. Collins¹, ¹Virginia State University, Petersburg, ²USDA, ARS, AFSRC, Beaver, WV.

Feed intake, growth, live grade, and blood metabolites were measured in 32 Boer (B) and Kiko (K)-sired intact male kids from Spanish (S) and Myotonic (M) dams, offered tall fescue (*Festuca arundinacea* Schreb.) hay (13.5% CP, 56.1% NDF, 37.9% ADF, 45.2% IVOMD) and supplemented with a corn (*Zea mays* L.)-based concentrate (16% CP) at either 2 or 3% BW. Kids were allocated to 6 pens (3 pens/supplement level) stratified by breed type and fed for 98 d. Total DMI by pen was lower for 2 than for 3% supplementation in the beginning of the trial (4.21 vs 3.55% BW), but decreased and was not different between groups in middle and end of the trial (treatment x time on trial; $P < 0.01$). Forage DMI was greater ($P < 0.001$) for 2 than for 3% supplementation throughout the experiment (1.46 vs. 0.79% BW) and was reduced ($P < 0.001$) in both groups in the middle and end of the trial. ADG and final BW were lower ($P < 0.001$) at 2% (101 g/d; 25.0 kg) than 3% (137 g/d; 28.4 kg) supplementation, but not affected by sire or dam breed. Kids supplemented at 2% BW had higher ($P < 0.01$) blood concentrations (mg/dl) of urea nitrogen (21.3 vs 19.3) and lower ($P < 0.001$) glucose (63.1 vs 72.1) compared to those supplemented at 3% BW; creatinine was similar. Supplement level had no effect on live grade, but B-sired kids scored higher ($P < 0.05$) than K-sired kids, and kids from M scored higher ($P < 0.05$) than kids from S. B-sired kids had higher ($P < 0.001$) blood concentrations of urea nitrogen (21.7 vs 19) and creatinine (0.63 vs 0.57) and lower ($P < 0.01$) glucose (65.9 vs 69.2) compared to K-sired kids. Kids from M dams had higher ($P < 0.05$) blood creatinine levels than kids from S dams. Data suggest that sire breed impacted live grade and blood metabolites. Animals receiving the 3% level of supplementation grew faster, but incomplete consumption towards the end of the trial would suggest that a maximum level of energy supplementation for finishing goats was between 2 and 3% BW.

Key Words: Crossbred Goats, Forage Intake, Growth

W174 Effects of the number of yearling Boer crossbred wethers per automated feeding system on feed intake, feeding behavior, and growth performance. A. L. Goetsch*, T. A. Gipson, G. Detweiler, R. C. Merkel, and T. Sahl, *E (Kika) de la Garza American Institute for Goat Research, Langston University, Langston, OK.*

Thirty-six growing Boer x Spanish wethers (initial BW = 30 ± 0.7 kg) were used in an 82-d experiment to determine effects of the number of animals per automated feeding system (NPF; 6, 8, 10, and 12), allowing consumption by only one animal at a given time, on intake of a pelleted 50% concentrate diet (60% TDN, DM basis), feeding behavior, and growth performance. During the entire experiment DMI (1436, 1506, 1506, and 1312 g/d), ADG (156, 167, 181, and 136 g/d), and ADG:DMI (108, 111, 120, and 103 g/kg for 6, 8, 10, and 12 NPF, respectively) were affected by NPF quadratically ($P < 0.05$, 0.05, and 0.06, respectively). The number of feeder visits (17.5, 17.2, 18.0, and 18.6) was similar among NPF, although feeder occupancy per day (97.8, 73.0, 83.3, and 70.7 min) and visit (5.69, 4.34, 4.84, and 3.79 min for 6, 8, 10, and 12 NPF, respectively) decreased linearly with increasing NPF ($P < 0.05$). The rate of DM consumption relative to feeder occupancy time tended to increase linearly ($P < 0.08$) with increasing NPF because of a relatively low value for 6 NPF (14.9, 21.2, 18.9, and 21.1 g/min for 6, 8, 10, and 12 NPF, respectively). In summary, 8 and 10 growing Boer crossbred wethers per automated feeder, allowing consumption of a 50% concentrate diet by one wether at a given time, resulted in growth

performance greater than for 12 wethers, apparently due to limited feed intake by 12 wethers. Also, performance with 6 wethers per feeder was slightly less than with 8 or 10, which may have involved factors such as limited feed intake resulting from conditions other than inadequate feeder availability.

Key Words: Goats, Feed Intake, Growth

W175 Influence of progesterone on synchronization and pregnancy rate of Alpine does. M. L. Looper^{*1}, R. C. Merkel², E. R. Loetz², A. L. Goetsch², L. J. Dawson³, J. M. Burke¹, and R. Flores⁴, ¹USDA-ARS, Dale Bumpers Small Farms Research Center, Booneville, AR, ²E (Kika) de la Garza American Institute for Goat Research, Langston University, OK, ³College of Veterinary Medicine, Oklahoma State University, Stillwater, ⁴University of Arkansas, Fayetteville, AR.

Forty-one non-lactating Alpine does were used in December to evaluate the effects of progesterone on synchronization and pregnancy rate. Body weight and condition score (1 to 5; 1 = extremely thin) averaged 49.1 ± 1.2 kg and 2.85 ± 0.05, respectively. Prior to the experiment, visual observation detected 95% of does exhibiting behavioral estrus. Does were blocked by age (mean age = 3.2 ± 0.3 y) and assigned to receive progesterone (P4) via an intravaginal insert (CIDR) for 12 d (n = 24) or no P4 (n = 17). Does with a CIDR were administered prostaglandin F2_α 15 h prior to CIDR removal. All does were fitted with a HeatWatch (HW) transmitter to record estrous activity and exposed to intact or epididymectomized bucks (1 buck/5 does) with marking harnesses. Does were observed twice daily (0700 and 1700; 20 min/observation) to confirm behavioral estrus. Ultrasonography was performed to determine pregnancy (mean = 56.6 ± 1.9 d post-breeding). Visual observation verified that 50% of does exhibited behavioral estrus within 24 h after CIDR removal, and 93% of does within 48 h. HeatWatch detected 50% of estruses identified by visual observation. Pregnancy rate was not different (P = 0.46) in does receiving P4 (41%) or no P4 (53%). A majority (93%) of does exposed to progesterone via a CIDR for 12 d exhibited estrus within 48 h post-CIDR removal. Furthermore, visual observation was more accurate at detecting does in estrus than HW. Pregnancy rates were not influenced by progesterone exposure.

Key Words: Goats, Progesterone, Synchronization

W176 Effect of breed and litter size on yields of milk, milk fat, and milk protein in Boer x Spanish and Spanish does. B. Tamir, R. C. Merkel^{*}, T. A. Gipson, and A. L. Goetsch, E (Kika) de la Garza American Institute for Goat Research, Langston University, OK.

Forty-four pregnant does (22 Boer x Spanish (BS), 3 to 4 yr of age; 22 Spanish (SP), 3 to 5 yr of age) were used to evaluate effects of breed and litter size on total milk yield and yields of fat and protein. All does were housed in one pasture and had unlimited access to prairie hay (1.1% N, 66.5% NDF, 63% IVDMD), water, and trace mineralized salt. Seventeen does (9 BS and 8 SP) had single kid (SK) litters and the remaining 27 does (13 BS and 14 SP) had litters of two or three kids (MK). Prior to milking, does and kids were separated at 1600 and weighed. Milking occurred at 0900 the following morning, after which kids were reunited with does. Does were milked once every 2 wk through wk 12 of lactation in a 10-stanchion, automated milking parlor (WestfaliaSurge Inc., Naperville, IL) with an automatic milk sampler. Oxytocin (0.5 ml) was administered 5 min prior to milking to stimulate milk letdown. Milk samples were placed in vials with a preservative and analyzed for fat and protein using a DairyLab II milk analyzer (MulitSpec Ltd., Wheldrake, York, England). Individual total milk, fat, and protein yields were calculated from test day data using Shook adjustment factors. Data were then analyzed using analysis of variance with genotype, litter size, and the two-way interaction as independent variables. Total milk (50.1 vs 37.9 kg; SE = 4.2) and milk protein yields (1.7 vs 1.2 kg; SE = 0.16) were greater for BS vs SP (P < 0.06). In addition, total milk (49.1 vs 38.9 kg; SE = 3.65) and milk protein yields (1.7 vs 1.2 kg; SE = 0.14) were greater (P < 0.07) for MK than for SK does. No differences were seen in ADG of BS vs SP kids (73 and 65 g/d for B and BS, respectively; SE = 5.8) or between female and male kids. Kids of SK does had ADG greater than of MK (86.0 vs 52.5 g/d SE 4.4). Litter growth was similar between BS and SP does. In conclusion, BS does produced more milk

than did SP does, although this was not accompanied by greater kid ADG.

Key Words: Goats, Milk Yield, Breed

W177 Evaluation of predictions of body weight and feed intake by growing crossbred Boer goats with a goat simulation model. M. Villalquiran^{*1}, L. C. Nuty², T. A. Gipson¹, A. L. Goetsch¹, and H. D. Blackburn³, ¹E (Kika) de la Garza American Institute for Goat Research, Langston University, OK, ²Cooperative Agricultural Research Center, Prairie View A&M University, Prairie View, TX, ³USDA/ARS/NPA/NSSL/NAGP, Fort Collins, CO.

The Texas A&M Goat Simulation Model, with modifications such as of maintenance energy requirements, is being used in a collaborative project involving institutions primarily in the southern US. However, the model was developed before Boer goats and their crossbreds became prevalent in the US. Therefore, this study was conducted to evaluate model predictions of BW and cumulative feed intake (air-dry; FI) of growing crossbred Boer goats. Data for model evaluation were derived from Prairie View A&M University. There were four genotypes of wethers: Boer x Nubian (n = 10, age = 131.8 to 245.8 d, and BW = 32.14 to 48.27 kg), Spanish x Boer (n = 8, age = 111.4 to 231.4 d, and BW = 13.73 to 38.27 kg), Boer x Alpine (n = 10, age = 132.4 to 245.4 kg, and BW = 21.86 to 41.77 kg), and Boer x Nubian x Myotonic (n = 10, age = 115.0 to 235.1 d, and BW = 24.00 to 43.05 kg). Diet composition was 16% CP and 75% TDN (air-dry basis). Body weight and FI were determined at four times within the growing periods. Model evaluation with pooled data was conducted by regressing observed means of BW (BWO) and FI (FIO) against predicted values (BWP and FIP, respectively). The equation for BW was BWO = 3.73 (SE = 3.489) + (0.935 (SE = 0.0970) x BWP) (R² = 0.86), and that for FI was FIO = -6.84 (SE = 8.062) + (1.012 (SE = 0.0665) x FIP) (R² = 0.94). In conclusion, the model explained considerable variation in BW and FI of growing crossbred Boer goats and provided unbiased predictions. Increased prediction accuracy should result from improved inputs, such as mature BW.

Key Words: Goats, Simulation Model

W178 Goats for vegetation management: animal performance and carrying capacity. S. Hart^{*}, J. Joseph, and A. Goetsch, E (Kika) de la Garza American Institute for Goat Research, Langston University, Langston, OK.

The objective of this study was to measure factors that affect carrying capacity and animal performance of goats grazing diverse range sites to develop recommendations for stocking rates and expected animal performance. This study was the first year of a larger study on the use of goats for vegetation management, which was conducted in collaboration with six Native American Nations in Oklahoma with a variety of vegetation and range site capabilities. Yearling goats were taken to each site in May-June and weighed every 1 to 2 months. There were at least two pastures at each site. Animals were removed when forage availability became limiting, usually late summer or fall. Goats were heavily stocked to provide maximum vegetation control. Doeling and wether Alpine, Angora, Spanish, and Boer x Spanish cross goats were used. Average daily gain varied with site (P < 0.001), month of the grazing (P < 0.001), breed (P < 0.001), and sex (P < 0.001). Wethers gained more than does (3.3 vs -4.1 g/d). Alpine and Angora goats gained less weight than meat breeds and crossbreds. Goats gained the most weight the first grazing period and less weight subsequently as forage availability was reduced (12.7 vs -9.3 vs -13.6 g/d). Gain per hectare was not influenced by site or stocking rate (P > 0.10), whereas grazing days/ha were different (P < 0.001) for the different sites (P < 0.001; range 237-1,109 d) due to different forage productivities. Gain/ha had little relationship to stocking rate (P > 0.30), a consequence of grazing to remove all available herbage. Total gain for the season was most affected by site (P < 0.001), sex (P < 0.001), and breed (P < 0.001). When goats are grazed at a high stocking density to control vegetation, forage productivity is the greatest factor in determining carrying capacity and animal production although sex and breed can have effect.

Key Words: Goats, Vegetation Management, Stocking Rate

W179 Effects of feed restriction on heat production by mature meat goats. I. Tovar-Luna*, A. L. Goetsch, R. Puchala, and T. Sahlu, *E (Kika) de la Garza American Institute for Goat Research, Langston University, OK.*

Fourteen Boer (75%) x Spanish wether goats (51 ± 1.8 kg BW and 23 mo of age) were used to determine effects of a moderate degree of nutrient restriction on heat production (HP). The experiment consisted of a 26-d period (P1) followed by one of 46 d (P2). Wethers were fasted on the final 4 d of each period, with gas exchange measured on the last 2 d. Fasting was preceded by collection of feces and urine for 7 d, with the final 2 d for gas exchange. All wethers were fed a 60% concentrate diet at a level of intake near maintenance in P1 (P1-100 and P1-80 treatments). In P2, six wethers continued on this level of intake (P2-100 treatment); to mimic procedures in a separate experiment, eight wethers also continued at this level for 15 d but then had ME intake sequentially reduced by 10 and 20% for 10 and 21 d, respectively (P2-80 treatment). Dietary ME concentration in period 2 was greater ($P < 0.05$) for 80 than for 100 treatments (13.2 vs 12.4 MJ/kg DM). Intake of ME was lowest ($P < 0.05$) for P2-80 (529, 535, 552 and 474 kJ/kg BW^{0.75} (fasted) for P1-100, P1-80, P2-100, and P2-80, respectively). Fed HP was lowest ($P < 0.05$) for P2-80 (495, 505, 467, and 406 kJ/kg BW^{0.75}), whereas that while fasting was similar among treatments (287, 279, 273, and 253 kJ/kg BW^{0.75} for P1-100, P1-80, P2-100, and P2-80, respectively). The ME requirement for maintenance (ME_m) was greater ($P < 0.05$) in P1 than P2 (477, 487, 421, and 376 kJ/kg BW^{0.75}), and when analyzed for P2 separately ME_m was lower ($P < 0.10$; 374 vs 425 kJ/kg BW^{0.75}) and the efficiency of ME use for maintenance was greater ($P < 0.08$) for P2-80 than for P2-100 (0.689 vs 0.625). In conclusion, moderate feed intake restriction impacted HP by mature meat goats largely via decreasing that associated with or responsive to nutrient intake or workload rather than physiological processes responsible for fasting HP, with a magnitude of change in ME_m 65% of that in ME intake. Supported by USDA Project No. 00-38814-9500.

Key Words: Goats, Energy, Feed Intake

W180 Effects of length of pasture access on energy use by growing meat goats. T. Berhan, R. Puchala*, R. C. Merkel, T. A. Gipson, G. Animut, A. L. Goetsch, and T. Sahlu, *E (Kika) de la Garza American Institute for Goat Research, Langston University, OK.*

Six Boer x Spanish wethers (21 ± 1.0 kg BW) were used in two simultaneous 3 x 3 Latin squares to determine effects of different lengths of access to pasture with high availability of cool-season annual forage on energy expenditure (EE), retained energy (RE), ME intake, and grazing behavior. Wethers grazed a 0.7-ha pasture of wheat and rye in the fall/winter period for 4 (1200 to 1600), 8 (0800 to 1600), or 24 h; 4- and 8-h wethers were barn confined at other times. Periods were at least 18 d in length, with 4 d for total feces collection with bags, 2 d to measure heart rate (HR) and grazing behavior, and 1 d without feed or water for assessing body composition from urea space. EE was based on HR and the predetermined relationship between EE and HR for each wether, and ME intake was the sum of EE and RE. Available forage mass averaged 2,831, 2,176, and 2,443 kg/ha in period 1, 2, and 3, respectively. EE was greatest ($P < 0.05$) for 24 h (4.96, 5.13, and 6.19 MJ/d for 4, 8, and 24 h, respectively), although RE was similar among treatments (0.88, 2.16, and 1.57 MJ/d for 4, 8, and 24 h, respectively; SE = 0.361). Intake of ME was greater for 8 and 24 h vs 4 (5.84, 7.30, and 7.76 MJ/d for 4, 8, and 24 h, respectively). Gain of fat (15.7, 50.3, and 33.7 g/d for 4, 8, and 24 h, respectively; SE = 9.80) was responsible for numerically

greatest RE for 8 h, with similar gain of water, protein, and ash. As length of pasture access increased, number of steps (2,508, 4,569, and 6,412), time spent ruminating (4.42, 6.33, and 7.28 h), and time eating (3.77, 6.35, and 7.24 h for 4, 8, and 24 h, respectively) increased ($P < 0.05$). In summary, even though 4-h pasture access limited ME intake and eating time, EE was similar to that for 8 h. Full-day pasture access resulted in greater EE than for 8 h presumably because of differences in behaviors such as eating time and number of steps, yet ME intake was not different. In conclusion, these results suggest that with high availability of high-quality forage, limited pasture access of a minimal length could yield performance by growing meat goats at least comparable to that with continuous access. Supported by USDA Project No. 00-38814-9500.

Key Words: Goats, Grazing, Energy

W181 Effects of pasture inclusion of mimosa on growth by co-grazing goats and sheep. G. Animut*^{1,2}, A. L. Goetsch¹, G. E. Aiken³, R. Puchala¹, G. Detweiler¹, C. R. Krehbiel², R. C. Merkel¹, T. Sahlu¹, L. J. Dawson⁴, and Z. B. Johnson⁵, ¹*E (Kika) de la Garza American Institute for Goat Research, Langston University, OK*, ²*Animal Science Department, Oklahoma State University, Stillwater*, ³*USDA ARS Dale Bumpers Small Farms Research Center, Booneville, AR*, ⁴*College of Veterinary Medicine, Oklahoma State University, Stillwater*, ⁵*Department of Animal Science, University of Arkansas, Fayetteville.*

Effects of mimosa alley-cropped in grass/forb pastures on growth performance of co-grazing sheep and goat wethers were determined. Three sheep (Khatadin) and three goats (#8805 75% Boer), with initial BW of 22 ± 1.3 and 21 ± 0.7 kg, respectively, and age of 4 to 5 mo, grazed 0.4-ha pastures of grasses such as bermudagrass and johnsongrass and forbs (e.g., ragweed) for 16 wk. Three pastures with mimosa (3.1 m between rows and 0.46-m interval) and three without (W and WO, respectively) were divided into four paddocks for 2-wk rotational grazing. The number of mimosa trees per pasture averaged 928 and 904 at the beginning and end of the experiment, respectively. Daily mimosa leaf DM removal averaged 25.5 g per animal, although harvest was complete before the end of 2-wk grazing periods. Mimosa leaf samples averaged 2.81, 37.8, and 85.9% N, NDF, and IVDMD (true), respectively. Available forage (grass and forbs) mass was similar ($P > 0.05$) between treatments before (2,928 and 2,695 kg/ha; SE = 183.4) and after grazing (1,507 and 1,452 kg/ha for WO and W, respectively; SE = 140.4). Percentage of grass in forage determined by transect pre- (57.5 and 69.9%; SE = 8.34) and post-grazing (66.3 and 78.8% for WO and W, respectively; SE = 8.09) was not affected by treatment ($P > 0.05$). Pre-grazed forage concentrations of N (1.25 and 1.24%), NDF (64.5 and 63.8%), and IVDMD (52.9 and 56.2% for WO and W, respectively) were similar ($P > 0.05$) between treatments, as was also true post-grazing (N: 1.05 and 0.96%; NDF: 66.3 and 69.4%; and IVDMD: 49.0 and 48.0% for WO and W, respectively). ADG in the first (125 and 119 g/d; SE = 13.0), second (87 and 108; SE = 26.9), third (16 and 44 g/d; SE = 14.6), and fourth 4-wk period (-23 and 0; SE = 27.6) and in wk 1-16 (51 and 68 g/d for WO and W, respectively; SE = 8.6) was similar ($P > 0.05$) between WO and W. In summary, mimosa increased high-quality herbage available for grazing (mimosa leaf) but did not significantly influence growth performance of co-grazing sheep or goats, perhaps because of decreasing availability as 2-wk grazing periods advanced and/or relatively low intake of mimosa leaf. Supported by USDA Project No. 00-38814-9502.

Key Words: Goats, Mimosa, Co-Grazing

Animal Behavior & Well Being

W182 A computerized system for monitoring feeding behavior and individual feed intake of dairy cattle in loose-house conditions. A. Bach*^{1,2}, C. Iglesias², and I. Busto³, ¹*ICREA, Barcelona, Spain*, ²*IRTA-Unitat de Remugants, Barcelona, Spain*, ³*Diputació de Girona, Semega, Girona, Spain.*

The objective of this study was to develop and validate a computerized system to monitor feeding behavior and feed intake of loose-housed dairy cattle. The system consisted of 28 scales located in front of each self-locking place of a regular feed bunk. All cows had access to all scales indifferently. Each visit to the feed bunk was monitored by a transponder in the ear of each cow that was detected by a proximity

reader located at the top right corner of each head-lock. The data from the scales and the proximity readers were continuously recorded by a computer with an average scanning time of 3.5 s. The monitoring system was validated using all 28 feeding places and 51 lactating cows in a series of 5-h observations during 5 different days. During the observation periods two observers recorded the cow number and the exact time of the visit to each scale. The observed data were then compared with the computer records. To validate weight monitorization, on separate days the amount of feed consumed by a cow during a visit was also measured manually with an external scale. The average time spent in a given scale by each cow determined by direct observations was similar