Mar 6th, 12:00 AM

01. Animal Science

Southwestern Oklahoma State University

Effects of Hair Sheep Breed and Region of Origin on the Feed Dry Matter Requirement for Maintenance Without and With a Marked Feed Restriction

Arthur Goetsch & Ryszard Puchala

Abstract

The main objective was to determine if amounts of feed required for maintenance without and with a substantial restriction differ among hair sheep breeds and region of origin. Dorper (D; 46), Katahdin (K; 47), and St. Croix (S; 41) ewes were obtained from 45 farms in Midwest, Northwest, Southeast, and central Texas regions of the USA. The amount of feed offered was varied in the first 4 wk for stable body weight (BW), and average dry matter (DM) intake in wk 3-4 relative to BW0.75 was considered DM required for maintenance without restriction (DMm-m). Feed offered in wk 6-10 was 55% of DMm-m, with DM intake relative to BW0.75 in wk 9-10 considered the requirement with feed restriction (DMm-r). Region had little effect on any measure. The DMm-m was slightly greater for S than for D and K (49.4, 48.9, and 50.9 g/kg BW0.75 for D, K, and S, respectively; SEM=0.48). The decline in BW during the restriction phase was relatively small and similar among breeds (wk 9-10 vs. 3-4: 3.6, 3.2, and 2.9 kg for D, K, and S, respectively; SEM=0.21). The DMm-r averaged 43% less than DMm-m, again being greater for S than for D and K (28.3, 27.9, and 29.1 g/kg BW0.75 for D, K, and S, respectively; SEM=0.28). In conclusion, the amount of feed required for BW maintenance was greatest for S regardless of feed restriction, but differences were minor. The hair sheep exhibited considerable capacity for decreasing the feed requirement for maintenance when offered feed was markedly restricted.

Assessing Wellbeing in Dairy Goats

Terry Gipson, Luana Ribeiro, & Roger Merkel

Abstract

Behavior is a key indicator of animal welfare and wellbeing. The objective of this study was to examine the effect of management system (confinement (C) or grazing (G)) on the behaviors of rumination time (RT) and lying/standing (L/S) in dairy goats. Forty Alpine goats (57.7±5.7 kg) in late lactation were randomly assigned to one of four groups. A replicated switchback design was used with Groups A and C the Confinement-Grazing-Confinement (CGC) and Groups B and D the Grazing-Confinement-Grazing (GCG) sequence. Each group spent 1 wk in each management system. A 40% forage diet was offered free-choice in both systems, with some growing forage available for goats in G as well. Goats were fitted with two tri-axial accelerometers, one in an elastic, nose-band halter and the other attached to the hind leg. Data were analyzed using mixed methods procedures under SAS software. Rumination time and L/S were not affected ($P>0.10$) by sequence or replicate. Goats in G had greater ($P<0.01$) RT than those in C (12.7 vs 10.2 min/h). Regardless of management system, goats had lower RT in the second week than in the first or third week of the experiment (12.2, 10.2, and 11.9 min/h in wk 1, 2, and 3, respectively). Daily L/S behavior was not affected ($P>0.10$) by management. Lying time was 726 min/d in C and 699 min/d in G. Standing time was 714 min/d in C and 741 min/d in G. These results indicate that management system affects rumination time but not lying/standing behavior in dairy goats

Growth on Pasture and in Confinement of Young Kiko Bucks

Margaret Garcia-Gill, Terry Gipson, & Jessica Quijada

Abstract

Growth rate of young meat goats is a key factor in the profitability of the enterprise. Langston University (LU) in partnership with the American Kiko Goat Association conducted a Second Generation Buck Performance Test in 2019. The performance test measured average daily gain (ADG) in two phases, 6 weeks on pasture followed by 9 weeks in confinement. Seventy-seven Kiko bucks less than one-year of age completed both pasture and confinement phases. The pasture phase was conducted on a 57-acre pasture with native grasses and forbs in Logan county. Bucks were supplemented at 0.5% body weight (BW 25.8 ±0.18 kg) daily to facilitate visual inspection of animals. The confinement phase was conducted at LU's testing facility with automated feeders utilizing a total-mixed ration fed free-choice. Bucks were weighed every 2 weeks on pasture and every week in confinement. ADG was calculated by linear regression using R. On pasture, ADG ranged from -48 g/d to 194 with an average of 91 g/d and a median of 98 g/d. In confinement, ADG ranged from -13 g/d to 230 g/d with an average of 113 g/d and a median of 114 g/d. Five bucks on pasture had a negative ADG compared to 2 bucks in confinement. The Spearman rank correlation between ADG-pasture and ADG-confinement was -0.15 ($P>0.17$) indicating that ADG on pasture was not a good predictor of ADG in confinement and vice versa. Future buck performance tests should incorporate pasture and confinement phases to more precisely identify

Relationships Among Body Condition Score, Linear Measures, Body Mass Index, and Growth Performance of Yearling Alpine Doelings

Arthur Goetsch, Terry Gipson, & Ryszard Puchala

Abstract

Alpine doelings (54; initial body weight [BW] and age of 32 kg and 306 days, respectively) were used in a 12-week study to evaluate relationships among body condition score (BCS), body mass indices (BMI), and growth performance with 75% forage diets. Linear measures were height at the withers (Wither), length from the point of the shoulder to hook bone (Hook) and pin bone (Pin), and circumference from heart girth (Heart). BMI included BMI1 (BW/Wither), BMI2 (BW/Hook), BMI3 (BW/Pin), BMI4 (BW/Heart), BMI6 (BW/(Wither x Hook)), BMI7 (BW/(Wither x Pin)), BMI8 (BW/(Heart x Hook)), and BMI9 (BW/(Heart x Pin)), all in g/cm2. Correlation coefficients of BCS were 0.39 0.21, and 0.32 for BW, average daily gain (ADG), and dry matter intake (DMI) in g/day, respectively, with nonsignificant r for residual feed intake and ADG:DMI. The r were 0.71, 0.58, 0.66, 0.69, 0.78, 0.67, and 0.812 between BMI1, BMI3, BMI4, BMI6, BMI7, BMI8, and BMI9 and BW; 0.36, 0.45, 0.42, 0.34, and 0.42 for BMI2, BMI3, BMI6, BMI7, BMI8, and BMI9 and ADG; and 0.49, 0.56, 0.47, 0.63, and 0.58 for BMI1, BMI3, BMI6, BMI7, and BMI9 and DMI in g/d, respectively. BMI were not related to residual feed intake, and there were some BMI with weak relationships to ADG:DMI. In conclusion, relationships between measures of performance and BMI were stronger than those for BCS and, thus, BMI should receive future attention to objectively assess body condition.

Persistence of Mycobacterium avium subspecies paratuberculosis in composted fecal matter of Spanish goats

Roger Merkel & Jessica Quijada

Abstract

Johne's Disease (JD), caused by Mycobacterium avium subspecies paratuberculosis (MAP), is a contagious, chronic, and fatal disease of ruminants. In Oklahoma, incidences of JD must be reported to the State Veterinarian's Office. MAP is also associated with Crohn's Disease (CD) in humans; however, there is no reported link between JD and CD. MAP is difficult to eradicate; it reportedly can survive pasteurization and is tolerant of heat. The American Institute for Goat Research (AIGR) tests its goats and sheep for JD and culls test positive animals. One carcass disposal method used by AIGR is composting. The present study assesses MAP persistence and viability under composting conditions. Three JD positive Spanish does, as indicated by ELISA and fecal PCR, were held for 3 days in elevated 4' x 4' pens for fecal collection. Fecal samples, 5 to 6 g, were sealed in Ankom™filter bags (F57), 9 bags/doe. Does were euthanized according to AIGR standard procedures and composted using barn sweepings and chopped wheat straw. Filter bags were placed near the carcass and at three other locations in the pile. Internal pile temperatures reached 130, 132, and 144°F for the three carcasses. After 75 days, the piles were opened and filter bags retrieved for PCR analysis. Results for all samples were positive indicating the MAP is detectable by PCR after 75 days of mortality composting reaching temperatures of 130 to 144°F. Samples are undergoing bac

Pregnancy Rate and Embryo Viability for Timed Laparoscope-aided Insemination in Response to Chorionic Gonadotropins Given in the Early Transitional Breeding Season and GnRH 5 Days Post Insemination

Rommel Calle

Abstract

The objective of this study concerned the influence of gonadotropin given 24 h prior (E; n=26) or 24 h after (L; n=40) removal of intra-vaginal progestagen (P4) used for 12±1 d on pregnancy rate (PR) and embryo viability (EV) of mixed parity lactating and non-lactating Alpine goats bred during the early transitional breeding phase. A control (C) group (n=38) did not receive gonadotropins. PR was evaluated at 18 to 24 d (non-return to estrus; NRE), 30 d (pregnancy specific protein B; PSPB), and at 40 d (ultrasound imaging; UI). Goats were time-bred at 48 h after P4 insert removal by laparoscopy (LAI; n=75) using frozen-thawed semen (400 x 106 sperm/mL and having >45% motility) or by natural service (NS; n=29). GnRH analogue was given (n=51) 5 d after insemination, and the remaining goats (n=53) received a placebo. Overall PR at 18 to 24, 30, and 40 d post breeding (dpb) for LAI and NS was 77 and 72 (P>0.60), 68 and 66 (P>0.80) and 69 and 69% (P>0.97), respectively. A logistic model was used to determine the absence of effect of E/OS protocol (P>0.81), 5d GnRH (P>0.37), and their interaction (P>0.66). In summary, gonadotropins given before or after P4 removal for PR of C, E, and L were 76, 73, and 76 at NRE (P>0.91), 66, 65, and 70 at PSPB (P>0.89), and 66, 69, and 73 at UI (P>0.81), respectively. EV to 30 and 40 d was 90% and was not influenced by E/OS (P>0.42), 5 d GnRH (P>0.18), or their interaction (P>0.23). Lactation influenced EV at 30 (P<0.03) but not at 40 dpb (

Influence of GnRH Given 5 Days After Intrauterine Insemination or Natural Service on Embryo Viability and Progesterone Levels on day 16 and 30 of Goats Estrus Synchronized With GnRH or eCG/hCG

Fabiola Encinas Aspiazu

Abstract

Objectives of this study were to determine the influence of GnRH given 5d after breeding on embryo mortality (EM) and of progesterone levels on day 16 and 30 of goats estrus synchronized with gonadotropins. A total of 54 lactating and non-lactating Alpine goats (3.1 yr old ±2 SD) of mixed parity were synchronized and fixed-time bred 48h after progestagen (P4) removal using laparoscopic-aided (LAI) insemination or natural service (NS) during the early transitional breeding phase using 11 or 12 or 13 days with 300 mg of intravaginal (P4), 2 mL of PGF2α given at P4 removal. In addition, 120 IU eCG/60 IU hCG (n=40), or a GnRH (n=14) was used 24h after P4 removal. Relatedly, to decrease EM, 25 goats received 1 mL of GnRH 5d post-breeding (dpb); the remaining 29 received 1 mL placebo. GnRH at 5 dpb GnRH influenced (P=0.06) EM, both at 30d (0 vs 50%) and at 40d (20 vs 50%), compared with goats receiving placebo. Although PR, evaluated at 30d and at 40, was 65±0.35%, the levels of P4 (ng/mL; average ±SE) were equivalent (P>0.12) for pregnant and non-pregnant goats at 5d (5.9±0.73 and 6.0±0.84), 16d (11.2±0.95 and 11.7±1.3), and 30d (56.2±0.74 and 8.3±1.0), respectively. We conclude that gonadotropin source given 24h post P4 removal leads to similar PR using LAI or NS. Related variables of parity, lactation, and days of P4 exposure (11, 12 or 13) did not influence EM or PR. However, GnRH if used 24h after P4 exposure, and also given a

Follicular Dynamics and Estrus Response of Alpine Goats Estrus/Ovulation Synchronized During the Early Transitional Reproductive Phase Using eCG/hCG Given Early or Late

Erick Loetz

Abstract

This study aimed to quantify the size of peri-ovulatory (PO) follicles and the influence of eCG/hCG (PG600®) on estrus and ovulation. A total of 122 PO sites from 14 non-lactating Alpine goats ranging from 1 to 6 kiddings, averaging ±SD 3.9 ±2.0 years of age, 56.3 ±5.0 kg of body weight (BW), and 2.6 ±0.2 body condition score (BCS), were evaluated in the early transitional reproductive phase. Goats were randomly assigned to one of three E/OS protocols exposed to 12 d of 200 mg intravaginal progestagen (P4). The traditional (T; n=4) did not receive gonadotropins whereas the early (E; n=5) was given PG600 24 h prior to P4 removal. Both T and E received prostaglandin (PGF2α) concurrent with P4 removal. The reverse (R; n=5) received PGF2α 24 h prior to P4 withdrawal as well as PG600 concurrent with P4 withdrawal. Ovaries were scanned trans-rectally by ultrasound imaging during 4 consecutive d starting with the first i.m. injection of 1.0 mL PGF2α or 1.5 mL PG600. Using a logistic model, variables age, BW, BCS, and parity did not have influence (P>0.05). Standing estrus response to each E/OS (T, E, or L) up to 24 h after P4 removal, ascertained using teaser bucks, was 50, 80, and 80% (P>0.05), respectively. Likewise, ovulation was 100, 80, and 100%; and the average ±SE number of ovulations/goat was 2 ±0.41, 1 ±0.32, and 1.3 ±0.49 (P>0.05). The location of the Graafian follicle was similar between left and right ovaries (P

Influence of Age, Parity, Breeding Procedure, Ostium Cervix Type, and Vaginal Secretion on Depth and Time of Cervix Transversion in Boer Goats

Joshua Farris & Erick Loetz

Abstract

Pregnancy success resulting from artificial insemination (AI) is directly related to depth of semen deposition in the female's reproductive tract and inversely related with stress caused by the procedure. Hence, the objective of this experiment was to determine if breeding procedure, age, parity, ostium cervix type, and vaginal secretion influence the depth and time of cervix transversion. This study evaluated 10 nulliparous (N), 17 primiparous (P), and 31 multiparous (M) Boer goats with average ±SD age, BW, and BCS (mode) of 2.1 ±0.98, 40.6 ±9.3, 2.75; 3.4 ±1.3, 49.9 ±10.8, 2.5; 5.5 ±1.4, 58.2 ±8.0, 2.5, respectively. Goats were synchronized for 14 d with 200 mg of intravaginal progestagen (P4) and 1 and 2 mL of i.m. PGF2α on day 0 and day 14, respectively. Goats in estrus were colored marked by teaser bucks showing that 95% percent expressed standing estrus. Two technicians inseminated by transcervical AI or by catheter 46 to 50 h after P4 removal. Ostium cervix type was classified as Rose or Other and vaginal volume secretion (VVS) was determined with an arbitrary scale. A LSM general linear model was used to determine statistical significance. None of the variables influenced the time of cervix transversion ($P>0.13$) or AI catheter passage depth through the cervix when measured in cm ($P>0.07$) or by the number of cervical rings crossed ($P>0.14$). Goats in estrus had increased VVS, which a reduced model for depth in cm, showed th

Burning for Redcedar (Juniperus virgiana) Control in Oklahoma

Raquel Lourencon & Terry Gipson

Abstract

The objective of this study was to measure the degree of control of redcedar provided by burning in Oklahoma. There were three research locations in Oklahoma, Langston, Mannford, and Midwest City (0.81 ha). The redcedar population was inventoried, quantified as to height, width, and GPS coordinates. The surrounding area was cleared by clipping cedars and the dry cedars (fuel) were stacked on the border of sites to be burned. A fire plan was made and burns were conducted in the three locations. Percentage green canopy was scored 3 months after burning. Percentage green canopy of the trees according to size (short; ≤1.83m or tall; > 1.83m) and presence of fuel were analyzed using Chi-Square statistics. Burning was more effective in Langston with 33% of green canopy remaining (P<.001), while Mannford and Midwest City averaged 64%. In all locations the presence of fuel around the trees potentiated the fire and reduced green canopy to 28% as compared with the trees not surrounded by fuel with 79% of green canopy (P<0.001). In Midwest City, taller trees were better controlled by fire and averaged 60% of green canopy, while the shorter trees averaged 69% (P = 0.021) with no significant differences due to height of tree in Langston and Mannford or when data of all three locations were analyzed together. The presence of fuel around the trees can potentiate the fire and give a better control of recedar. However, burning was not a very effective method to control redcedar.

Evaluating the potential of using a 5-gallon pail to compost kitchen meat scraps

Jaliyah Flowers & Roger Merkel

Abstract

Kitchen vegetable scraps are commonly composted but not meat trimmings due to potential for odors. This trial compared composting raw (R) and cooked (C, boiled in 3-cm water) beef scraps to a control treatment of no scraps (N) in 20-l plastic pails. Six pails, 2 per treatment, had 1.3 cm holes drilled around the circumference in a 5 by 8 cm triangular pattern to allow air exchange for aerobic decomposition. A composting medium of ground alfalfa hay and wheat straw (AW, 50:50 by weight) was hand mixed with water to roughly 50% moisture content. As R and C pails were filled with AW, approximately 250 g R or C was placed in the center at both the 1/3 and 2/3 fill level. N pails were filled with AW only. Detectable odor by sniff test and temperature (T, 5 locations, 5 and 20 cm horizontal depth at 1/3 and 2/3 fill levels and at 20 cm vertical depth in the pail's center) were recorded thrice weekly for 7 wk after which decomposition of meat scraps was rated on a 5-point scale, 1 - none to 5 - total. No offensive odor was detected at any time. Peak T, 30 to 55°C across all pail locations, occurred in wk 1 and declined to 20 to 21°C across locations by the trial's end. All decomposition scores were 4 except one R location that recorded a 3, indicating moderate to good decomposition. Over time, AW in all pails dried, became moldy, and attracted flies. Periodically mixing pail contents and adding water may have helped maintain T for decomposition and prevented m

The use of Pregnancy Specific Protein B at 32 Days to Establish Embryo Number in Alpine, Spanish, Boer, Tennessee Stiff-Leg, and Angora Goats of different parity

Alexia Thurmond, Joshua Farris, & Erick Loetz

Abstract

Embryo number detected early in pregnancy allows for management actions to decrease prenatal wastage. Hence, this study used placenta specific serological protein B (PSPB) levels to determine its association with embryo number as determined by transabdominal ultrasound imaging (UI). Goat breeds used were dairy (Alpine; n=156), meat (Spanish, Boer, and Tennessee Stiff-Leg; n=165, 75, 54, respectively) and mohair-producing (Angora n=14). A total of 179 nulliparous, 119 primiparous, and 166 multiparous goats were evaluated. Overall, Alpine, Spanish, Boer, Tennessee Stiff-Leg, and Angora goats had an average ±SD age in years, body weight in kg (BW), and the mode of body condition score (BCS) of 2.8 ±9.2, 47.6 ±9.2, 2.0; 3.3 ±2.0, 36.8 ±9.6; 4.3 ±2.0, 52.8 ±11.4, 2.5; 3.7 ±2.2, 32.9. ±8.8, 2.5; 7.4 ±1.3, 40.7 ±11.3, 2.5, respectively. Blood samples were collected by jugular venipuncture at 32 days post first breeding (dpfb) from goats that were estrus and ovulation synchronized and bred by artificial insemination or natural service. To determine PSPB levels serum samples were processed by a commercial lab using BioPRYN®; an ELISA-based assay. An ordinal logistic classification model was used to determine statistical significance. Both, PSPB ($P<0.001$) and breed ($P<0.005$) influenced the prediction of embryo number (i.e., 0, 1, and 2 or 3) detected clinically by UI at 42 dpfb. Although a tendency was found for BW and parity

Birds Preferring High Protein Worms with Low Fat Versus Worms with Low Protein and High Fat.

Ashton Marlar

Abstract

Wild birds in Bartlesville and Tulsa, Oklahoma due to their dietary needs which may change due to the drop in temperature from summer to winter might require higher protein foods. The most common types of birds in the area of the feeders are Robins, Doves, Finches, and sparrows. Protein is necessary for construction of enzymes, tissues, and needed for reproduction, mating, and the growing process. The reproduction, mating, and growing process requires more nitrogen then what the simple maintenance of the body holds and proteins are the source of this nitrogen. By setting out two different feeders each containing worms with high and low protein as well as different fat levels. It was observed that birds preferred the lower protein wax worms with higher fat over the higher protein superworms with lower fat.

Effect of Combination of Branched-Chain and Limiting Amino Acids on Growth Performance and Feed Intake Regulation in Nursery Pigs Fed with Low Protein Diets

Cedrick Shili, Julia Sutton, & Mohammad Habibi

Abstract

The aim of this study was to assess the effect of combination of dietary branched-chain amino acids (BCAA; i.e. leucine, isoleucine and valine) and other limiting amino acids (LAA; i.e. lysine, methionine, threonine and tryptophan) at levels greater than suggested requirements on growth performance and feed intake parameters of pigs fed with low protein diets.

Forty-eight weaned barrows were individually assigned to: 1) positive control: 20% crude protein (CP); 2) negative control (NC): 14% CP; 3) NC with LAA 25% > suggested levels (L25); 4) NC with LAA 50% > suggested levels (L50); 5) NC with LAA and BCAA 25% > suggested levels (LB25); 6) NC with LAA and BCAA 50% > suggested levels (LB50). At week 4, blood and tissue samples were collected after euthanasia and data were analyzed with univariate GLM.

LB50 group had higher final body weight than L50. Average daily feed intake was greater in LB50 and LB25 than L50 and L25, respectively. Plasma serotonin level was reduced by LB50 relative to L50 and NC. The mRNA abundance of hypothalamic TPH1 and 5HTR2B was affected by diet, but no differences were detected among groups. The mRNA abundance of hypothalamic NPY was higher in LB50 and LB25 than NC.

The growth performance and intake of pigs fed with LP diets supplemented with both BCAA and LAA was improved partly through hypothalamic NPY.

Effect of a Corn-Expressed Phytase on Growth Performance, Blood Metabolites and Fecal Microbiota of Nursery Pigs Fed Diets with Reduced Calcium, Phosphorous, and Protein

Cedrick Shili

Abstract

Moderately low protein (LP) diets with reduced calcium (Ca) and phosphorus (P) may decrease the nutrients excretion from the swine production, but these diets reduce the growth performance of pigs. The objective of this study was to investigate the effect of a corn-expressed phytase (CEP) on growth performance, serum metabolites and fecal microbiota in nursery pigs.

Forty-eight weaned barrows were allotted to six treatments: A) standard protein (24%), B) LP (13%), C) LP+2000 FTU/kg CEP, D) LP+4000 FTU/kg CEP, E) LP & low Ca and P+2000 FTU/kg CEP and F) LP & low Ca and P+4000 FTU/kg CEP. At week 4, blood and fecal samples were collected for metabolites analysis and microbial amplicon sequencing, respectively.

Pigs fed with C and F had higher average daily gain than those fed with B. No differences among groups were detected for serum Ca, P and alkaline phosphatase. Serum osteocalcin was lower for group F than group B. The feces of pigs in group C was enriched in family Lachnospiraceae, while group D had higher abundance of genus Succinvibrio and group E had higher populations of genus Bifidobacterium and phylum Actinobacteria.

In conclusion, supplementation of moderately LP diets with a CEP decreased the negative effects of these diets on growth performance and produced differential effects on fecal bacterial population.