581 Evaluation of weaning hair sheep lambs at 63 or 120 d of age in an accelerated lambing system in the tropics. R. W. Godfrey* and A. M. Hogg, *University of the Virgin Islands, Agricultural Experiment Station, St. Croix, VI.*

This study was designed to evaluate the impact of weaning age on lamb and ewe productivity in an accelerated lambing system. St. Croix White ewes (STX; n = 25) and lambs (n = 43), and Dorper x St. Croix White ewes (DRPX; n = 33) and lambs (n = 44) were used. Lambs were weaned at 63 (CTRL; n = 44) or 120 d of age (LATE; n = 43) based on breed, sex and litter size. After weaning lambs were fed concentrate (2% BW/d) and grazed guinea grass. Ewes grazed guinea grass at all times. Weights were analyzed using breed and weaning age as main effects. Pregnancy was determined after a 35-d breeding season using transrectal ultrasonography. Ewe weight at breeding before the first lambing was the same ($P > 0.10$) as at the subsequent breeding (41.9 ± 1.1 vs. 41.6 ± 1.1 kg, respectively). At the start of the subsequent breeding 100% of LATE and 0% of CTRL ewes were nursing lambs ($P < 0.0001$). There was no difference ($P > 0.10$) in days to first heat in the breeding season between LATE and CTRL ewes (16.2 ± 1.3 vs. 14.0 ± 1.5 d, respectively). Lambing rate after the subsequent breeding was not different ($P > 0.10$) between LATE and CTRL ewes (72.4 vs. 75.9%, respectively). At weaning LATE lambs were heavier ($P < 0.0001$) than CTRL lambs (20.5 ± 0.6 vs. 11.9 ± 0.5 kg, respectively) and DRPX were heavier ($P < 0.0001$) than STX lambs (18.7 ± 0.5 vs. 13.7 ± 0.6 kg, respectively). At 63 d LATE and CTRL DRPX lambs were heavier ($P < 0.0001$) than LATE and CTRL STX lambs (15.4 ± 0.7 and 13.7 ± 0.6 kg vs. 11.5 ± 0.7 and 10.2 ± 0.7 kg, respectively). At 120 d LATE DRPX were heavier ($P < 0.006$) than CTRL DRPX lambs (23.6 ± 0.9 vs. 20.2 ± 0.8 kg, respectively) and LATE STX were heavier ($P = 0.09$) than CTRL STX (17.3 ± 0.9 vs. 15.1 ± 0.9 kg, respectively). Weaning lambs at 120 d of age in an accelerated lambing system resulted in heavier lambs at weaning with no negative impact on ewe productivity. Late weaning led to a decrease in the amount of time that lambs received high cost, imported feed resulting in a savings of $10 per lamb.

Key words: hair sheep, weaning, lambs

582 Comparison of two forage systems for performance of lactating doe and kid meat goats in Kentucky. K. Andries* and E. Sherrow, *Kentucky State University, Frankfort.*

Meat goat producers are looking at forage based systems of production as possible ways to reduce cost of production and access higher value markets. To be successful, research is needed to evaluate different forages during critical production periods, especially around lactation. Many producers in the upper southeast region have difficulty finding forages to meet the needs of lactating animals in spring. This study was designed to evaluate differences in doe and kid performance on tall Fescue (*Festuca arundinacea*) and cereal rye (*Secale cereale* L.) during early lactation in spring kidding meat goats. Sixty-six crossbred meat goat does with 106 Boer sired kids were available for use in this project. Two 0.88 ha pastures were available for this project. One was seeded in the fall of 2009 to cereal rye and the other had an established stand of tall fescue. Does were evenly divided between the 2 treatments with consideration for the number of kids and age. Grazing started April 20 and continued for 28 d. Data collected included starting and ending weights for both kids and does, doe body condition score, and color score of the mucous membranes of the eye. Average daily gain was calculated for each kid and doe on the project. The data was analyzed using Proc GLM in SAS. Both kids and does on the rye pasture had significantly ($P < 0.01$) higher average daily gains. Kids on the rye pastures gained 5.36 kg while those on the fescue pastures only gained 2.60 kg in the 28 d period. The does in both groups lost weight but the ones on the rye group lost 1.68 kg and the fescue group lost 3.57 kg over the 28 d. In the kid data birth type was not significant for average daily gain or total weight gain of the kids, number of kids nursing was not significant for any trait on the doe data set. There was a significant ($P < 0.01$) change in eye membrane color score with does in the rye group having improved scores while the fescue group had poorer scores. This research indicates that there is potential for forage based goat production in the upper southeast if the proper forages are utilized to ensure adequate nutrition for the doe during lactation.

Key words: meat goat, forage

583 Effect of synchronization protocols (Ovsynch vs 2PG) and GnRH on reproductive performance in goats. N. Ahmad*, H. Riaz, and M. Abdullah, *University of Veterinary and Animal Sciences, Lahore, Punjab, Pakistan.*

The objective of the experiment 1 was to determine if the estrus response and pregnancy rate are similar between the 2 synchronization protocols Ovsynch vs 2PG(2 PGF2α injections 10 d apart) in Pakistani goats. Ovsynch goats (n = 14) received an intramuscular injection of GnRH analog (12.5 µg lecirelin, Dalmaralin, Fatro, Italy) on Day 0 and treated with injection of PGF2α analog (37.5µg d-cloprostenol, Dalmazin, Fatro, Italy) on Day 7 followed by second injection of GnRH analog after 48 h (Day 9). 2PG goats (n = 14) received 2 intramuscular injection of PGF2α analog 10 d apart. Onset of estrus and its duration were assessed by aproned male while follicular development, ovulation rate and pregnancy rate were determined by transrectal ultrasonography. All does were bred naturally 12 h after standing heat. Estrus response was non-significant ($P > 0.05$) between regimens (Ovsynch 71%, 2PG 100%). Interval from standing heat to ovulation (24 ± 3.7 h and 30 ± 2.7 h), ovulatory diameter (7.1 ± 0.2 mm, 7.0 ± 0.2 mm), pregnancy rate (43% (6/14) and 78% (11/14) and fecundity (1.6 ± 0.5, 1.6 ± 0.7) did not differ ($P > 0.05$) between Ovsynch and 2PG groups respectively. The objective of experiment 2 was to determine if administration of GnRH at the time of natural breeding enhances the pregnancy rate in goats. Goats were randomly allocated into 2 groups (GnRH, n = 11 and Control, n = 14). GnRH does received 0.63µg lecirelin on the day of natural breeding (12 h after standing heat) while control does did not receive any treatment. Interval from standing heat to ovulation (31.2 ± 2.9 h, 36 ± 5.3 h ($P > 0.05$), ovulatory diameter (6.7 ± 0.1mm, 7.2 ± 0.5 mm ($P < 0.05$), pregnancy rate (54% (6/11) and 64% (9/14), ($P > 0.05$) and fecundity (1.5 ± 0.5, 1.7 ± 0.5, ($P > 0.05$) were evaluated between GnRH and control does respectively. It is concluded that Ovsynch appears to be similar to 2PG protocol in terms of the reproductive performance; however, this needs to be tested on larger sample size. Furthermore, use of GnRH at the time of breeding does not improve reproductive parameters in goats.

Key words: synchronization, estrus response, pregnancy rate

584 Carcass fat and muscle measurements in terminally sired F1 lambs. M. R. Mousel*[1], T. D. Leeds[2], D. R. Notter[3], H. N. Zerby[4], S. J. Moeller[4], and G. S. Lewis[1], *[1]USDA, ARS, US Sheep Experiment*

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Science-based data for growth and carcass traits of terminal-sire breeds of sheep can be used to improve the value of market lambs, but information for modern terminal-sire breeds in the United States is limited. Thus, the effects of terminal-sire breed on live weight, chilled carcass weight, loin muscle area, and 3 measures of fat were determined in F1 wether lambs. Over a 3-yr period, Columbia, USMARC Composite, Suffolk, and Texel rams were mated with mature Rambouillet ewes. From weaning until harvest each year, the F1 lambs (n = 518) were fed a step-up finishing diet and harvested in 3 groups at a targeted mean BW of 54.5, 61.4, or 68.2 kg. Lamb BW was measured before transport to the abattoir. The following traits were measured on each carcass: kidney pelvic fat (KPF), chilled carcass weight (CCW), 12th and 13th rib loin muscle area (LMA), backfat thickness (BF), and body wall thickness (BWT; approximately 12.7 cm ventral to the dorsal midline). All traits were analyzed with mixed models that included fixed effects of sire breed, year of harvest (YR), harvest group (HG), weight-on-test deviation from the breed mean, and random effects of sire and maternal grandsire. The YR and HG were significant ($P < 0.03$) in all models. Sire breed was significant ($P < 0.03$) for all traits except BF ($P > 0.09$) and BWT ($P > 0.06$). Suffolk-sired lambs had the largest BW and CCW, 65.66 and 32.56 kg, respectively, and Texel-sired lambs had the smallest, 59.43 and 29.06 kg, respectively. Suffolk-sired lambs had the most KPF, 1.29 kg, and Columbia-sired lambs had the least, 1.13 kg. Texel- and Suffolk-sired lambs tended to have the greatest BF and BWT, while Columbia-sired lambs tended to have the least. The LMA for Suffolk- and Texel-sired lambs was greater than that for Columbia- and Composite-sired lambs, 17.05, 16.79, 15.47, and 16.049 cm^2, respectively. Producers can use data such as these to select a terminal-sire breed of sheep that will match their production system and improve the value of their market lambs.

Key words: lamb, terminal sire, carcass

585 Compositions of volatile compounds in fat tissues from male and female Hu sheep. Y. J. Peng*, J. Lin, and J. X. Liu, *Institute of Dairy Science, College of Animal Sciences, Zhejiang University, Hangzhou [310029], P. R. China.*

Fat tissue is rich in the volatile compounds that determine the flavor of meat. Hu sheep is widely distributed breed in Southern China. In this study, the compositions of volatile compounds in fat tissue from male and female Hu sheep were analyzed to investigate the characterization of Hu sheep meat. Twenty-four Hu sheep,12 male and 12 female, were slaughtered as 2 year-olds. The perirenal and caudal subcutaneous fat tissues were sampled and vacuum-packed from all the sheep. After aging at 4°C for 24 h, the samples were stored at −80°C to avoid oxidation, and then were moved to −20°C before analysis. Solid-phase microextraction technique was used to extract the volatile compounds from 1 g of sample with 50/30 μm divinylbenzene-carboxen-polydimethylsiloxane fiber at 120°C. The volatile compounds were then analyzed by gas chromatography-mass spectrometry technique. All data were analyzed using the GLM procedure of SAS software system. Fifty-seven volatile compounds were detected in the fat tissue samples. Forty compounds were found to distinguish ($P < 0.05$) between male and female sheep, among which 17 compounds were aldehydes, including hexanal, heptanal, octanal, nonanal, undecanal and dodecanal. Fat tissues in female sheep contained more aldehydes than those from male sheep. Since these compounds were mainly derived from lipid oxidation, it is suggested that different anti-oxidation level caused the varying contents of aldehydes, which accounted for the difference in contents of volatile compounds between male and female sheep. A principal component analysis showed that nonanal, triacetin, butylated hydroxytoluene were the main compounds played the most important role in the first principal component. Contrast to the sexual factor, location of fat tissue caused less difference, and only 23 compounds were found to be different between 2 kinds of fat tissues ($P < 0.05$). These results suggested that sexual factor mainly contribute to the characterization of volatile compounds composition.

Key words: fat tissue, volatile compounds, sheep

586 Chemical composition of milk of West African Dwarf (WAD) ewe fed Mexican sunflower leaf meal based diets during early and late lactation. A. H. Ekeocha*, *University of Ibadan, Ibadan, Oyo, Nigeria.*

Milk composition of major and minor components is affected by feeding regimens, ration components and forage: grain ratios. In view of this a study was conducted to determine the chemical composition of milk of WAD ewe fed MSLM based diets during late lactation. Sixteen lactating WAD ewes weighing between 22.80 and 26.03 kg on a basal diet of *Panicum maximum* were allotted into four treatment groups of four replicates each. The experiment was conducted using completely randomized design with four replicates. The Mexican sunflower leaf (MSL) replaced wheat bran (WB) gravimetrically at 0,15,30,45% . The control treatment (treatment A) had no MSL but treatments B, C and D had 15, 30 and 45% MSL as graded replacement for WB. The experiment lasted 6 weeks . Feed and water were provided ad libitum and routine vaccination and medication administered. Parameters measured include milk total solids, butter fat, crude protein, lactose, casein, energy, calcium and phosphorus. Apart from milk ash, observed variation were not significant ($P > 0.05$) during early and late lactation, although values of milk composition were higher during late lactation for milk total solids, fat, protein, ash, casein, energy, calcium and phosphorus while lactose values were reduced during late lactation. Inclusion of up to 45% MSLM based diets enhanced the milk composition of ewe and can be used successfully in place wheat bran without any adverse effect.

Key words: milk composition, West African dwarf ewe, Mexican sunflower leaf