

containing various percentages of mulberry hay. Twenty-four Ile de France lambs (15.0 kg BW, 3 mo old) were confined in individual stalls and fed one of 3 diets: sugar cane + concentrate with 0.00% mulberry hay; sugar cane + concentrate with 25.0% mulberry hay; or sugar cane + concentrate with 50.0% mulberry hay. The sugar cane was used as forage (variety IAC 86–2480) that gave a total dietary roughage to concentrate ratio of 50:50, with 10.0% surplus allowance. The confinement period comprised of 80 d, and the first 14 d were allowed for adaptation of animals to the diet and the stalls. The data were analyzed using SAS as a completely randomized design, with 3 treatments ( $n = 8$ ), and the means were compared using the Tukey test. The lambs were slaughtered at 32.0 kg BW and carcasses were weighed to obtain the HCW and kept in cold storage at 6°C for 24 h, to assess the cold carcass weight (CCW). The HCW (14.1 kg) and CCW (13.7 kg) were not affected ( $P > 0.05$ ) by different percentages of mulberry hay in the diet. There was also no difference ( $P > 0.05$ ) in empty BW (25.9 kg) and true yield (54.7%). The results showed that inclusion of mulberry hay in the diet did not alter carcass characteristics, indicating that it can be used in lamb feeding without negative effects on production.

**Key Words:** confinement, protein sources, sheep

**T370 Relationships among internal fat depots and subcutaneous fat in sheep.** R. C. Gomes,\* C. Constantino, F. Fernandes Jr., N. A. Koritiaki, M. V. G. Niwa, M. N. Marconato, F. A. B. Castro, and E. L. A. Ribeiro, *Department of Animal Science, State University of Londrina, Londrina, Parana, Brazil.*

The understanding of the relationships among the different adipose tissue depots as well as accurately predicting their masses is critical for animal growth modeling. Thus, the aims of this study were 1) to evaluate the phenotypic correlations among internal fat masses and subcutaneous fat thickness in sheep and 2) to predict the internal total fat mass using KPH fat weight and subcutaneous fat thickness information. Sheep in this study were either Texel-cross or Santa Ines-cross, 6 to 61-mo old and  $27.3 \pm 6.5$  kg empty BW, composed of ewes ( $n = 7$ ), ewe lambs ( $n = 15$ ) and ram lambs ( $n = 26$ ). Ewes were grazing (*Brachiaria* spp.) whereas ram and ewe lambs were feedlot finished before slaughter. The sum of kidney, pelvic and heart fats (KPH, kg), the mesenteric (MES, kg) and omental (OME, kg) fats were measured at slaughter. The subcutaneous fat thickness was measured 24 h postmortem (0 to 2°C) on the *Longissimus dorsi* muscle, at the 12th-13th rib region. Pearson correlation analyses were carried out. Simple and multiple regressions were employed to generate prediction equations with VISC as the dependent variable and both SFT and KPH as predictors. Linear and quadratic terms were tested. High correlations of KPH with OME, MES and VISC were observed (0.79; 0.70 and 0.92;  $P < 0.001$ ). However, the correlations were only moderate between SFT and OMEN (0.43;  $P < 0.01$ ) and between SFT and VISC (0.43;  $P < 0.01$ ). Correlations between SFT and MES (0.20;  $P = 0.12$ ), and between SFT and KPH (0.53;  $P = 0.0001$ ) were both non-significant and moderate, respectively. The equation generated for predicting VISC as a function of KPH was  $VISC, \text{ kg} = 0.31571 + 2.51105 * KPH, \text{ kg}$  ( $R^2 = 0.8418$ ;  $RMSE = 0.214$  kg). SFT did not enter ( $P > 0.05$ ) in the model with KPH as predictor. The prediction equation using SFT as independent variable was  $VISC, \text{ kg} = 0.68429 + 0.2508 * SFT, \text{ mm}$  ( $R^2 = 0.1826$ ;  $RMSE = 0.4867$  kg). No quadratic terms were significant for both KPH and SFT. The KPH fat weight, unlike SFT, is highly correlated with the fat mass presented on the gastrointestinal tract. Accordingly, the KPH fat but not SFT can be used to predict the total internal fat mass in sheep with relative accuracy.

**Key Words:** channel fat, visceral fat, *Ovis aries*

**T371 Impact of different stocking rates of goats under pine silvopasture systems on understory biomass, crown cover density, and animal productivity.** I. Howard,\* A. S. Kumi, N. K. Gurung, U. Karki, R. Smith, S. G. Solaiman, W. H. McElhenney, and B. R. Min, *Tuskegee University, Tuskegee, AL.*

Meat goat production has potential to be integrated into the pine silvopasture systems as a means of supplemental income for forest land owners. Objectives were to determine changes in understory plant biomass, crown cover density and animal productivity using different goat stocking rates. A completely randomized design was used on an 11 years old loblolly pine silvopasture systems at the Federation of Southern Cooperatives in Epes, Alabama with 36 Kiko male goat kids ( $(21.0 \pm 1.04$  kg initial BW and 4 to 5 mo of age) using low (L; 4 goats/acre), medium (M; 8 goats/acre), and high (H; 12 goats/acre) stocking rates from July through October, 2011. Goat BW, understory plant biomass and plant cover density (CD) were determined before and at the end of grazing. The initial understory plant biomass was similar among treatments ( $P > 0.05$ ) but decreased linearly ( $P < 0.05$ ) with increasing stocking rates at the end of grazing. Goats were similar in BW at the start and at the end but did not grow as expected. Although the initial CD values were similar among treatments ( $P > 0.05$ ), a significant treatment x height interaction was detected for the final CD values. Differences among treatments were detected ( $P < 0.05$ ) at the lower heights (0.5 m and 1.0 m), but no differences among treatments were detected at heights above 1.0 m. Overall fecal DOM and CP ratios were 4.9, 5.1, and 4.8 for L, M, and H stocking rates, respectively and were not different among treatments ( $P > 0.05$ ) indicating that the diet quality selected by goats were similar. Based on these data, goats can be utilized to minimize understory up to 1.0 m in pine silvopasture systems; however, feed supplementation may be required to improve animal performance.

**Key Words:** meat goats, silvopasture, stocking rate

**T372 Influence of trenbolone acetate and estradiol ear-implant level on feedlot-performance of hair lambs.** B. Ortiz\*<sup>1</sup>, J. J. Álvarez<sup>2</sup>, and R. Barajas<sup>1</sup>, <sup>1</sup>FMVZ-Universidad Autónoma de Sinaloa, Culiacán, Sinaloa, México, <sup>2</sup>Productores de Ovinos de Guanajuato, SPR de RL, Silao, Guanajuato, México.

Four hundred and 80 hair lambs ( $21.83 \pm SD 2.28$  kg) were used to determine the influence of trenbolone acetate and estradiol ear-implant level on feedlot-performance of hair lambs. Lambs were weighed, grouped by initial weight in 4 blocks of 120 lambs, and placed in  $4 \times 5$  m elevated pens fitted with plastic-slot floor (30 lambs per pen). Each block contained 4 pens, and the pen constituted the experimental unit. In a complete randomized block design experiment, inside of each block, pens were randomly assigned to receive one of 4 treatments: 1) Feedlot diet without additional implant (CTRL); 2) Ear-implanted with 20 mg of trenbolone and 4 mg of estradiol (T20); 3) implanted with 40 mg of trenbolone and 8 mg of estradiol (T40); and 4) implanted with 60 mg of trenbolone and 12 mg of estradiol (T60). Trenbolone /estradiol levels were obtained with the application of one, 2 or 3 pellets contained in the regular implant-cartridge of Component TES (Elanco). Lambs were weighed on d 1 and 30. Results were analyzed by ANOVA and the quadratic trend tested by polynomial contrasts. Final weight showed a quadratic response ( $P = 0.02$ ) to implant-level with values of 27.7, 28.3, 28.5 and 28.4 kg for CTRL, T20, T40 and T60 treatments, respectively. A quadratic trend ( $P = 0.03$ ) was observed in ADG, with mean values of 195, 216, 223 and 220 g/day for CTRL, T20, T40 and T60 treatments, respectively. Dry matter intake was not affected by implant level ( $P > 0.30$ ). Gain:feed ratio responded in a quadratic form to implant-level ( $P < 0.01$ ), with mean values of 207, 229, 229, and 222 g of gain/kg of DMI