

differences in revenue come from changes to the number and weight of sale calves. Other contributions to variation in revenue are from values of cull cows, replacement costs and dystocia costs. Discounting procedures are not included. In contrast to other models, the software provides for sire selection by simulation rather than simply generat-

ing economic values for subsequent use. Accordingly, the model needs to directly incorporate heterosis effects from multibreed evaluation and corresponding EPD from sire summaries.

Key Words: Decision Support, Cow-Calf, Sire Selection

Goat Species: Products

652 Protein profile of goat milk in relation with udder health status and somatic cell counts. G. Pisoni¹, L. Basiricò², P. Moroni¹, U. Bernabucci^{*2}, and G. Savoini³, ¹Dipartimento di Patologia Animale, Igiene e Sanità Pubblica Veterinaria, Milano, Italy, ²Dipartimento di Produzioni Animali, Viterbo, Italy, ³Dipartimento di Scienze e Tecnologie Veterinarie per la Sicurezza Alimentare, Milano, Italy.

The prerequisite to produce hygienic milk and cheese is udder health and, therefore, intramammary infections are the most persistent and widely spread group of diseases of importance to milk hygiene in dairy goats. The effect of udder health on yield and quality of milk and, consequently, on cheese yield and quality has been established. Milk from mastitic udders exhibits greatly increased proteolytic activity. The activity of plasmin (PL), plasminogen (PG), and plasminogen activator (PA) and their correlation with goat milk quality parameters (casein, somatic cell counts (SCC), and udder health status) were investigated. Forty goats from two flocks were monitored and used to provide milk samples. Does were machine milked twice daily without teat post-dipping. 50 mL of milk was collected aseptically from each goat and kept at 4°C until bacteriological procedures. The SCC were determined for each milk sample by an automated fluorescent microscopic somatic cell counter. Activities of PL, PG, and PA in milk were determined with a colorimetric assay. 5 mL of each milk sample was centrifuged and skimmed milk was analyzed to determine protein profile by SDS-PAGE. Quantification of the electrophoretically separated proteins was done by densitometry. Milk samples were categorized on the basis of the presence or absence of pathogens (healthy or infected udder) and as low SCC (< 1,000 × 10⁶/mL), medium SCC (between 1,000 and 2,000 × 10⁶/mL), or high SCC (> 2,000 × 10⁶/mL). The health status of the udder modified only SCC and PA activity; both parameters were higher (P < 0.01) in infected udders. The increase in SCC was followed by increases (P < 0.001) in PL and PA activities and γ -1, γ -2 and proteose-peptone contents, and by decreases in PG activity and α -casein and β -casein contents. Results of the present study demonstrate that udder health is not the main factor responsible for the increase of proteolytic activity and alteration of protein profile of goat milk.

Key Words: Goat, Milk, Protein Fractions

653 Silymarin administration to periparturient dairy goats: effects on milk production and quality. D. Tedesco^{*1}, S. Galletti¹, S. Rossetti¹, J. Turini¹, and G. Varisco², ¹Department of Veterinary Sciences and Technologies for Food Safety, Milan, Italy, ²Istituto Zooprofilattico Sperimentale della Lombardia e dell'Emilia Romagna, Brescia, Italy.

Silymarin, a standardized extract from seeds of *Silybum marianum* L. (Gaertn) (milk thistle), is used for the treatment of liver diseases. Silymarin administration to periparturient dairy cows resulted in a lower postpartum body condition score (BCS) loss and a higher and earlier milk peak. The aim of the present study was to determine the effects of silymarin treatment in the periparturient period on lactation performance of dairy goats. A total of 24 dairy goats in their second pregnancy were divided into two groups according to BCS, health condition, and previous milk production. From 5 days 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 an oral drench. Individual milk production was recorded on 7, 14, 21, and 28 DIM. Milk samples were collected on the same days and analyzed for protein, fat, lactose, urea, and somatic cell count. The BCS was evaluated on d -7, 0, 14, 21, and 28 from kidding. Silymarin treatment significantly increased milk production. In all days considered, milk yield of treated animals was higher with respect to control animals (P < 0.05). These differences were on average from 0.61 to 0.92 kg/d for each animal. Milk quality parameters were not different between treated and untreated goats. BCS was not different between groups. We conclude that silymarin administration to periparturient dairy goats had a positive effect

on milk production without affecting milk quality, confirming our results obtained with dairy cows. Silymarin was kindly granted by Indena S.p.A.

Key Words: Silymarin, Dairy Goat, Peripartum

654 Effects of goat breed and stage of lactation on yield, sensory quality, and fatty acid concentration of soft cheese. S. S. Zeng^{*}, K. A. Soryal, B. A. Fekadu, K. Tesfai, and B. Bah, Langston University E (Kika) de la Garza American Institute for Goat Research, Langston University, Langston, OK.

In the United States, Nubian and Alpine goats are two major dairy breeds and most dairy goat herds have a seasonal lactation. In this study, the effects of goat milk obtained from two dairy farms with different breeds of goats at various stages of lactation on yield, composition, sensory scores, and fatty acids of soft cheese (Chevré) were evaluated. Results obtained from this study indicated that dairy goat breeds did not affect cheese composition, sensory scores, or fatty acid concentrations (P > 0.05) except oleic acid. However, milk from Nubian goats resulted in a much higher cheese yield (2.71 vs 1.69 kg/10 kg of milk), a lower oleic acid concentration, and a lower unsaturated fatty acid concentration than that from Alpine goats (P < 0.05). Soft cheese made from late lactation milk had higher fat, protein, and total solids concentrations and yields than mid-lactation milk (P < 0.05). While the sensory scores of Alpine goat milk cheese varied throughout lactation, those of Nubian goat milk cheese were virtually the same regardless of stage of lactation. In conclusion, if a dairy goat herd is raised to supply milk for cheesemaking, Nubian goats or a mixed herd with at least some Nubian goats will be advantageous to cheese makers for a higher premium for their higher cheese-yield milk. In addition, a year-round breeding program could help minimize variations in cheese composition, yield, and fatty acid concentration, resulting in a more consistent quality of cheese throughout lactation.

Key Words: Goat Milk, Cheese, Fatty Acids

655 Growth and carcass characteristics of castrated or intact male Boer X Spanish goats grazing Marshall annual ryegrass. C. Hopkins-Shoemaker^{*1}, S. Solaiman², C. Kerth¹, W. Jones¹, and D. Bransby¹, ¹Auburn University, Auburn, AL, ²Tuskegee University, Tuskegee, AL.

Castration of food animals is a common management practice that imposes unnecessary pain and stress, is an extra cost, and may reduce performance. This study was conducted to determine the effect of castration on growth and carcass characteristics of Boer x Spanish goat kids. Seven intact males and seven wether goats (BW 38.03 and 34.79 ± 0.35 kg, respectively) were continuously grazed on Marshall annual ryegrass (*Lolium multiflorum* Lam.) for 56 d. Body weights were recorded after 4 h withdrawals from feed and water, for two consecutive days, every 2 wk. After d 56 animals were harvested and hot carcass weight (HCW), cold carcass weight (CCW), dressing percent (DP), kidney and pelvic fat (KPF), longissimus muscle area (LMA), backfat (BF), and other carcass parameters were measured. Average daily gain over 56 d was greater (P < 0.05) for intact males than for wethers (139 and 66 g/d, respectively). Carcass selection grades were similar between treatment groups: no differences (P > 0.10) were observed in HCW, CCW, or DP between treatment groups. Wethers had higher (P < 0.05) KPF than intact males (0.51 and 0.23 kg, respectively); however, BF and LMA did not differ (P > 0.10) between treatment groups. These results indicate that castration of young market goats reduced growth and did not provide any distinct advantage in carcass characteristics.

Key Words: Goat, Castration, Carcass Characteristics

656 Influence of maternal breed on meat goat carcass characteristics. R. Browning, Jr.*¹, C. Chisley², O. Phelps², S. H. Kebe¹, B. Donnelly¹, M. Byars¹, and T. Payton¹, ¹Tennessee State University, Nashville, ²USDA-Agricultural Marketing Service, Baton Rouge, LA.

Spanish x Boer (n = 16) and Spanish x Kiko (n = 18) wethers (7 mo) and bucklings (5 mo) were harvested under USDA inspection to evaluate the effect of dam breed on carcass traits of crossbred kids. Boer and Kiko dams, respectively, originated from five and seven seedstock farms. Each dam was purebred or fullblood (93.75 to 100%). Traits of interest included live weight and conformation score, carcass grade, carcass weight, dressing percentage, wholesale cut weights, and edible meat yield. Live weight tended to differ (P = 0.08) between Boer (22.96 ± 0.94 kg) and Kiko kids (25.6 ± 1 kg). Hot carcass weight, cold carcass weight, and dressing percentage tended to be greater (P ≤ 0.1) for Kiko than for Boer F1 kids. Kids out of Boer dams had similar (P = 0.29) live conformation scores as their contemporaries out of Kiko dams. Carcass grade scores for Kiko F1 tended to be better (P = 0.08) than those for Boer F1 kids. Paired shoulder and hind leg primal cuts were heavier (P < 0.05) for Kiko (1.66 ± 0.08 kg; 3.05 ± 0.14 kg) compared to Boer (1.41 ± 0.08 kg; 2.59 ± 0.13 kg). Paired foreleg and loin weights for Kiko (2.11 ± 0.1 kg; 1.5 ± 0.09 kg) tended to be heavier (P ≤ 0.10) than for Boer (1.85 ± 0.1 kg; 1.28 ± 0.09 kg). Rib weights were not different (P > 0.2) between breeds of dam. However, when wholesale cut weights were adjusted for carcass weight, only the hind leg tended to be heavier (P = 0.06) for Kiko-cross kids than for Boer-cross kids. Proportional edible meat yields and meat to bone ratios from shoulder, loin, and hind leg were not affected (P > 0.15) by breed of dam. Preliminary results suggest that breed of dam may affect carcass traits from commonly sired crossbred kids.

Key Words: Meat Goat, Breeds, Carcass Traits

657 Size, color, and texture of major muscles from kid goat carcasses. K. W. McMillin* and A. P. Brock, *Department of Animal Sciences, Louisiana State University Agricultural Center, Baton Rouge, LA.*

Production of value-added products for ethnic and non-traditional goat meat consumers requires information about the constituent raw materials. Linear dimensions and color of major raw muscles from Boer-Spanish kid goat carcasses and texture after moist and dry cookery were determined in two successive years (n=18 and n=10). After weaning and pasture rearing with 0.11 kg/d of corn, kid goats of average 9 mo age and 25 kg were humanely sacrificed. Carcasses were chilled for 24 h at 4°C before evaluation of carcass conformation (selection 2.6), flank color (A⁷⁰), external fat score (1.0), and kidney, heart, and pelvic fat (1.8%). Dressing percentage averaged 41% and cold carcass weight 10 kg. Individual muscles were manually separated by knife from fat and bone within a 3 d period. Weight, length, and width (ruler), diameter (caliper), and color (reflectance spectroscopy) were recorded for *L. dorsi* (LD), *Semimembranosus* (SM), *Q. femoris* (QF), *B. femoris* (BF), *Triceps* (T), *G. medius* (GM), *Infraspinatus* (I), *Supraspinatus* (S), *Psoas major* (PM), *Semitendinosus* (ST), and *B. brachii* (BB) at the time of separation. Muscles from each carcass side were randomly assigned to moist (water bath at 100°C) or dry (167°C oven) heating to 77°C internal temperature. Muscle weights were LD=SM>QF>BF=T#8805GM>I=S=PM=ST>BB. The differences (P<0.05) in length and diameter between muscles were more variable than the differences in L*, a*, and b* color values between different muscles. Cooking losses were less (P<0.05) for larger than smaller muscles, with shear force greatest (P<0.05) for S and least (P<0.05) for ST, BB, PM, GM, QF, T, LD, and I. Cooking losses (24 to 36%) and shear forces (3.0 to 4.7 kg) for each muscle type did not differ (P>0.05) with type of heating. Time to reach internal temperature was longer with dry than moist heating. Year did not influence linear, color, or shear measurements in muscles of the same type. Characterization of different muscles will assist in identification of muscles suitable for retail goat cuts and for processing into value-added products.

Key Words: Goat, Muscle Profile, Color

ADSA - Growth and Development

658 Effects of intramammary endotoxin treatment on porcine milk composition, yield, and resultant piglet growth performance. A. C. W. Kauf*, D. C. Pighetti, A. L. Magliaro, D. A. Pape, L. C. Griel, Jr., and R. S. Kensinger, *Penn State University, University Park.*

Mastitis is a contributing factor to preweaning mortality in pork production. We performed an experiment utilizing an intramammary endotoxin (ET) challenge model (Kensinger et al., 1999), to determine the effects of mastitis on milk composition, yield, and resultant piglet growth performance. Following cross-fostering to equalize litter size on approximately d 3 of lactation, 11 parity-one Yorkshire sows were challenged (1.5 µg/gland/kg BW) on days 13 and 20. ET (from *E. coli* O55:B5) was infused into two functional, previously non-infused mammary glands on each experimental day. Milk was collected by manual expression from both control and ET-infused glands before and after ET-challenge up to 60 h post infusion, and analyzed for protein content and composition. Milk yield was estimated by weigh-suckle-weigh procedure, and daily piglet weights were recorded. ET-infusion increased rectal temperatures, which peaked at 1.7 °C above baseline at 5 h (P < 0.01), returning to normal by 24 h. ET-infusion increased milk log TNF-α 87 %, chloride 221 %, total protein 20 %, and albumin 44 %; and decreased β-casein 47 % relative to control samples (P < 0.01). Apparent proteolytic degradation of α_s-caseins in post-infusion milk samples was dramatic. ET-infusion decreased hourly milk yields 31 % on experimental days (P < 0.01). ET-infusion decreased 24 h weight gains 75 % for piglets nursing ET-infused glands relative to their control littermates during the first 24 h; the difference in 24 h weight gain between groups remained significant through 5 days (P < 0.01). Our data demonstrate significant increases in milk TNF-α, chloride, total protein, and albumin; significant decreases in milk β-casein and yield; and prolonged decreased daily weight gains of suckling piglets. The changes in milk composition are consistent with opening of tight junctions, and the ET-

challenge model is valuable for studying the effects of mastitis in the sow.

Key Words: Porcine Mastitis, Milk Yield, Piglet Growth

659 Effects of diet and bST on gene expression profile of heifer mammary parenchyma. B. J. Lew*^{1,2}, S. S. Sipkovsky¹, G. J. M. Rosa¹, J. S. Liesman¹, R. P. Radcliff¹, H. A. Tucker¹, M. D. S. Oliveira², and M. J. VandeHaar¹, ¹Michigan State University, East Lansing, ²UNESP Jaboticabal, São Paulo, Brazil.

Increasing growth rates in prepubertal heifers decreases age at puberty and subsequent milk production. Administration of bST before puberty increases parenchymal tissue and decreases adipose tissue within the udder. Our objective was to examine the effects of a high energy, high protein diet combined with injection of bST on gene expression profile within mammary tissue and identify key genes that mediate mammary development. The mammary tissue used was collected in a previous experiment conducted in 1994 (Radcliff et al., 1997). In the experiment 38, Holstein heifers were randomly assigned to one of four treatments: low or high diet, each with or without bST. RNA from parenchymal tissue of 32 heifers (8/treatment) was extracted, and RNA quality was checked using the Agilent Bioanalyzer. RNA was pooled (2 samples/pool), and the 16-pooled samples were examined using a bovine-specific cDNA microarray (National Bovine Functional Genomics Consortium Library, NBFGC) containing 18,263 uniquely expressed sequence tags (EST). A Loop design was used with cDNA from the 16-pooled samples labeled with Cy3 or Cy5 dyes prior to microarray hybridization. Gene expression data were normalized for dye intensity biases using a robust local regression technique (SAS PROC LOESS). Significance levels of differential gene expression among treatments were assessed using a mixed model approach. Compared with no bST, bST altered expression of 671 genes (368 down and 303 up-regulated) in the high diet (P<0.05) and 365 genes (210 down and 155 up-regulated) in low diet (p<0.05).