Beef Species

W49 **Characterization of growth traits of Senepol heifers and bulls from birth through a year of age in the tropics.** Robert W. Godfrey* and Henry C. Nelthropp, *Agricultural Experiment Station, University of the Virgin Islands, St Croix, VI.*

Senepol is a *Bos taurus* breed of beef cattle that is well suited to the tropics. This study was conducted to evaluate growth of Senepol bull and heifer calves from birth to a year of age using calves born in spring of 2012 (n = 11 heifers and 10 bulls) and 2013 (n = 17 heifers and 16 bulls). Hip height (HHT) and BW were measured at weaning and yearling. Pelvic area (PA) of heifers and scrotal circumference (SC) of bulls were measured at yearling. Average daily gain (ADG) was calculated from birth to weaning and weaning to yearling. Data were analyzed using year and sex of calf in the model with sire as a covariate due of unequal representation of sires across years. Age of dam was not significant ($P > 0.10$) for any trait. There was no effect of year or sex on birth weight ($P > 0.10$). Bulls had a greater 205-d adjusted weaning weight ($P < 0.008$) than heifers (242 ± 6 vs. 217 ± 6 kg, respectively) but there was no effect of year ($P > 01.0$). Bulls had a greater ADG from birth to weaning than heifers (0.96 ± 0.03 vs. $\pm 0.83 \pm 0.03$ kg/d, respectively) but there was no effect of year ($P > 0.10$). Weaning HHT was greater ($P < 0.003$) in bulls than in heifers (111.5 ± 0.7 vs. 108.3 ± 0.7 cm, respectively) and greater ($P < 0.002$) for calves born in 2012 than in 2013 (111.9 ± 0.8 vs. 107.8 ± 0.6 cm, respectively). Bulls had a greater 365-d adjusted yearling weight ($P < 0.01$) than heifers (293 ± 7 vs. 268 ± 7 kg, respectively) but there was no effect of year ($P > 0.10$). Calves born in 2012 had lower ADG from weaning to yearling ($P < 0.004$) than calves born in 2013 (0.28 ± 0.02 vs. 0.37 ± 0.02 kg/d, respectively) but there was no effect of sex ($P > 0.10$). Bulls had greater ($P < 0.0008$) yearling HHT than heifers (118.8 ± 0.7 vs. 115.4 ± 0.7 cm, respectively) and calves born in 2013 had greater HHT ($P < 0.0002$) than those born in 2012 (118.9 ± 0.6 vs. 115.2 ± 0.7 cm, respectively). Yearling SC of bulls was not different ($P > 0.10$) between years (24.7 ± 1.3 vs. 24.4 ± 0.9 cm, respectively). The PA of heifers was not different ($P > 0.10$) between years (145.5 ± 7.7 vs. 136.4 ± 5.5 cm2, respectively). These data show that there are differences in the growth traits between Senepol bull and heifer calves reared under tropical conditions.

Key Words: heifer, bull, cattle

W50 **Association of skin thickness and resistance to *Rhipicephalus microplus* in Simmental heifers.** J. A. II V. Silva*[1], A. M. Maiorano[2], A. C. Verdugo[3], Rogerio A. Curi[1], and L. A. L. Chardulo[1], *[1]Universidade Estadual Paulista, Botucatu, SP, Brasil, [2]Universidade Estadual Paulista, Jaboticabal, SP, Brasil, [3]University of Saskatchewan, Saskatchewan, Canada.*

The aim of this study was to verify association among skin thickness (ST) and resistance to the *Rhipicephalus microplus* ticks on Simmental animals, artificially infested with ticks. Eighteen Simmental heifers, with about to 450 age days and belonging a farm in the Avaré/SP/Brazil were used. ST was measure on the left side behind the shoulder of animal by a tuberculin caliper. Three artificial infestations were performed using approximately 20,000 *R. microplus* larvae on each animal. Counts female ticks were measured in the 19th and 23th range days after infestations, what only left side of the animal and engorged females with sizes larger than 4.5 mm were considered. Total tick counts (TTC) and payback percentages (PP) variables were transformed, respectively, in $\log_{10}$ ($n + 1$) and $PP^{0.25}$. MIXED procedure of SAS considering repeated measurements was used. Models considering the skin thickness group (STG), divided into thin leather and thick leather, infestation (IN) and their interactions as fixed effects were used in the analyzes for both variables. Mean comparisons were performed using Tukey-Kramer test ($P < 0.05$). Repeatability coefficient (R) of the variables was estimated by intraclass correlation between the same animal measures. The IN effect was significant ($P < 0.05$) for the studied variables. The STG mean were 7.11 ± 0.74 and 11.24 ± 0.86 for thin leather and thick leather, respectively. Means values observed, in chronological order, were 0.33 ± 0.29, 1.98 ± 0.22 and 2.36 ± 0.38 to TTC and 1.61 ± 1.35, 6.64 ± 0.83 and 8.40 ± 1.64 for PP. It is probably that the amount of detached female of animals significantly increased the infesting larval on pastures, caused significantly increased ($P < 0.05$) of TTC and PP in the following counts. Value of R were 0.61 for both variables, suggesting that resistance to ticks measures observed in the same animal have similar values in artificial infestations data. There was no significant effect of STG, indicating that the ST trait is not an attribute that influences in cattle resistance to ticks.

Key Words: artificial infestation, beef cattle, repeatability

W51 **The effect of selection using residual average daily gain and marbling EPD on growth performance and carcass traits in Angus steers.** J. B. Wells*, J. R. Segers, J. Duggin, J. K. Bertrand, R. Rekaya, and T. D. Pringle, *University of Georgia, Athens, GA.*

Steers (n = 68) were produced at the NW Georgia REC from the mating of Angus bulls selected for high and low residual ADG (RADG) EPD and high and average marbling (MARB) EPD to Angus cows. The resulting 2 × 2 factorial design contained 2 Angus sires in the following treatments: high RADG, high MARB (Hi/Hi); high RADG, average MARB (Hi/Avg); low RADG, high MARB (Lo/Hi); and low RADG, average MARB (Lo/Avg). Steers from the matings were used to determine the effects of RADG and MARB selection on growth performance and carcass traits. Steer weights were recorded and composition was determined via ultrasound at weaning (229 d) and yearling (391 d) ages. Steers entered the feedlot and were fed ad libitum for 2 wk before completing a 65-d GrowSafe Beef feed test to measure DMI, ADG, and residual feed intake (RFI). Steers were slaughtered at approximately 1.3 cm of backfat and USDA yield and quality grade data were collected after 24 h at 4C. Data were analyzed using ANOVA with the main effects of RADG and MARB EPD levels in the sire. Significant interactions were found for weaning and yearling weights and ultrasound REA, while DMI tended to be affected ($P < 0.10$). The Hi/Hi steers were heavier ($P < 0.05$) than Lo/Hi and Hi/Avg steers at both ages, while Hi/Hi and Lo/Avg steers had larger REA than Hi/Avg steers. There was a tendency ($P = 0.07$) for yearling ultrasound IMF to be higher in steers from high MARB sires. Hi/Avg steers consumed less feed than Lo/Avg, with the Hi/Hi and Lo/Hi steers being intermediate. No RADG effects were observed for ADG ($P = 0.96$); however, RFI tended to be lower ($P = 0.11$) in steers from the high RADG sires. Slaughter weights were higher ($P < 0.01$) for high vs low RADG groups, however, HCW and dressing percentage were not affected. USDA yield and quality grades did not differ ($P > 0.10$) across RADG or MARB groups; however, carcass REA was larger ($P < 0.05$) in Hi/Hi compared with Lo/Hi steers. In conclusion, selection using RADG appears to improve growth efficiency in Angus cattle,

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however, further work is needed to fully characterize the potential for this trait as a selection tool in beef production systems.

Key Words: residual ADG, RFI, carcass

W52   Relationship of grazing activities with residual feed intake measured in female Angus cattle carrying different genetic marker. Ana Ines Trujillo*[1], Alberto Casal, Mariana Carriquiry, and Pablo Chilibroste, *Facultad de Agronomia, Universidad de la Republica, Montevideo, Uruguay.*

A significant difference in residual feed intake (RFI, −1.02 vs. 1.02 kg of DM) measured under grazing conditions in beef heifers carrying different genetic marker (presence – V group or absence – C group of 3 allelic variants of the genes neuropeptide Y (NPY), IGF-1 and leptin) was reported. The objective of this study was to explore if grazing activities would be associated with the RFI measured in 2 beef cattle groups: carrying the genetic marker associated with low RFI or not carrying the genetic marker. Grazing activities were measured in beef heifers (370 ± 28 d, 294 ± 37.4 kg of BW, n = 18) grazed on unrestricted and high quality temperate pasture. Grazing activities (grazing, ruminating and idling) were determined using behavior recorders in 2 sequential moments (wk 4 and wk 5) during herbage dry matter intake (DMI) determinations. Intake rate was obtained as the ratio between herbage DMI and actual grazing time of each animal. Data were analyzed as repeated measures. The model included genetic marker group (V or C), week and their interaction as fixed effects and paddock as random effect. More efficient heifers under grazing condition (V group) tended ($P \leq 0.14$) to spent 45 min less in grazing time and to graze at a lower intake rate than less efficient heifers. Our results suggest that grazing activities would contribute to the biology behind RFI in growing heifers at grazing condition. Further experiments are needed to uncover drivers for better understanding the variation in RFI under grazing condition

Key Words: residual feed intake, beef cattle, grazing

W53   Reproducibility of estimators and validity of feed efficiency models. Carl A. Old*[1], Heidi A. Rossow[2], and Thomas R. Famula[2], *[1]A3 Cattle Co., LeGrand, CA, [2]University of California, Davis, Davis, CA.*

A residual feed intake (RFI) equation (ADFI = a + b_1 x $BW^{0.75}$ + b_2 x ADG), used to estimate ADFI in individual animals, was evaluated to determine if specification was correct and if predicted ADFI was equal to observed ADFI (validity). We evaluated 2 data sets of growing beef cattle using ordinary least squares (OLS), bootstrapping (BS) or a first order (FO) model in which final BW (BW_f) was a function of initial BW (BW_0) and cumulative DMI (DMI_c). The FO equation was $BW_f = BW_0 e^{kDMIc}$. The RFI model was improperly specified ($P < 0.10$), predicted ADFI, both OLS and BS, differed from observed ($P < 0.05$), OLS and BS parameter estimates within and among data sets were not unique *(P < 0.05)* and the model failed all tests of external validity ($P < 0.05$). Functional forms of the variables were inconsistent with published classical energetic relationships among ADFI, BW and ADG. The intercept term, a, was either 0, negative or positive. The latter are inconsistent with biology; when BW and ADG are 0, a must likewise be 0. Parameter estimate b_1 indicated that ME intake at $NE_g = 0$ (ME_m) was either 0.280 x $BW^{0.75}$ or 0.165 x $BW^{0.75}$; both of these are greater ($P < 0.05$) than the NAS/NRC estimate of 0.131 x $BW^{0.75}$. Parameter estimate b_2 indicated that efficiency of ME utilization for gain was either outside or within the range of biological possibility. The FO model was internally and externally invalid for both data sets ($P < 0.05$) although

R^2 were > 0.90. It appears that initial and final BW, as state variables, improve model fit in describing the relationship among ADFI, BW_0 and BW_f. Improper specification for the RFI model, parametric instability, lack of internal and external validity, irreproducibility of estimators between data sets and among published studies, and the random nature of residuals indicate the linear RFI model is a poor predictor of ADFI and of animal efficiency, for the data sets examined. A first order function (nonlinear) better describes relationships between BW change and ADFI. However, regardless of model, BW change and ADFI may be inadequate descriptors of efficiency.

Key Words: efficiency, beef cattle, residual feed intake

W54   The effect of selection using residual average daily gain EPD on growth and reproductive performance in Angus heifers. J. B. Wells*[1], J. R. Segers, J. Duggin, J. K. Bertrand, R. Rekaya, and T. D. Pringle, *University of Georgia, Athens, GA.*

Forty-five heifers were produced at the Northwest Georgia Research and Education Center in Calhoun from the random mating of commercial Angus cows to Angus bulls selected for high and low residual ADG (RADG) EPD and high and average marbling EPD. The experimental design was a 2 × 2 factorial design with 2 Angus sires represented in each of the following treatments: high RADG, high marbling (Hi/Hi); high RADG, average marbling (Hi/Avg); low RADG, high marbling (Lo/Hi); and low RADG, average marbling (Lo/Avg). Heifers from the matings were studied to determine the effects of selection for RADG and marbling on growth and reproductive performance. Heifer weights were recorded and composition was determined via ultrasound scanning at 229 d (weaning) and 391 d (yearling) of age. There were no differences observed in weaning and yearling weights between the groups ($P > 0.19$). Weaning 12th rib fat levels were different with low RADG animals having greater fat depth ($P = 0.01$) than high RADG. Interactions between RADG and marbling were present in yearling 12th rib fat ($P = 0.04$), weaning IMF ($P = 0.07$), and yearling IMF ($P = 0.08$) with Lo/Avg heifers having greater values than Hi/Avg heifers. Blood samples were drawn at 8 mo, 10 mo, and 12 mo of age to directly quantify the level of progesterone present using the Siemens Coat-A-Count Progesterone RIA procedure. At 10 mo of age, 26% of low RADG heifers had reached puberty while no high RADG heifers had reached puberty. By 12 mo of age, 37% of low RADG and 19% of high RADG heifers had reached puberty. At approximately 14 mo of age, heifers were synchronized and artificially inseminated using the 14-d CIDR-PG & TAI protocol. Heifers that returned to estrus within 30 d were bred a second time by AI before exposure to a bull. Overall AI conception rates were Hi/Hi: 82%, Hi/Avg: 53%, Low/Hi: 89%, and Low/Avg: 80%. The average age at calving (714 d) was not different between groups ($P = 0.73$). In conclusion, selection using RADG may negatively effect early reproductive performance in Angus heifers, however, further work is needed to fully characterize the potential for this trait as a selection tool in beef production systems.

Key Words: residual ADG, heifer, reproduction

W55   Evaluation of serum 25-hydroxyvitamin D concentrations of beef calves during the spring and summer seasons. Jessica L. Powell*[1], Deborah M. Price[1], Matthew J. Hersom[1], Joel V. Yelich[1], G. Allen Bridges[2], Scott Bird[2], Mary E. Drewnoski[3], and Wade A. Sutton[4], *[1]University of Florida, Gainesville, FL, [2]University of Minnesota, Grand Rapids, MN, [3]University of Nebraska, Lincoln, NE, [4]University of Idaho, Moscow, ID.*

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Vitamin D is known to be critical for the growth and development of young calves and contributes to activation of innate immune defenses of cattle. The 25-hydroxyvitamin D (25D) metabolite is the precursor to the active vitamin D hormone and its concentration in serum serves as an indicator of an animal's vitamin D status. Normal serum 25D concentrations originally described for cattle are between 20 and 50 ng/mL, but recent evidence has indicated that serum 25D concentrations below 30 ng/mL are insufficient for adequate health. Because little information is available regarding vitamin D status of beef calves, the objective of this study was to evaluate serum 25D concentrations of beef calves born during the spring calving season. Four separate cohorts of calves were studied where serum samples were collected at birth and again 3–4 weeks after birth or in mid to late summer. Serum 25D concentrations were determined by using a 25D ELISA. In the first cohort, the average (±SD) concentrations of 16 Angus and Brangus calves born in Florida were 25.6 ± 12.1 ng/mL at birth in February and 26 ± 10.3, 53.8 ± 12.9, and 59.5 ± 17.2 ng/mL in March, July, and September, respectively. In the second cohort, the average serum 25D concentrations of 12 Angus and Brangus calves born in Florida were 16.4 ± 11.1 ng/mL at birth in April and 29.4 ± 9.7, 43.8 ± 11.8, and 51.0 ± 12.6 ng/mL in June, July, and September, respectively. In the third cohort, the average serum concentrations of 20 Angus calves born in Minnesota were 13.2 ± 6.4 ng/mL at birth in April and 45.9 ± 7.6 ng/mL in July. In the fourth cohort, the average serum 25D concentrations of 15 Charolais calves born from January to April in Idaho were 3.0 ± 2.2 ng/mL at birth and 10.5 ± 7.7 ng/mL at 3 weeks of age. Averages of the serum 25D concentrations for the dams of the calves in cohorts 2, 3, and 4 at calving were 69.5 ± 16.0, 57.7 ± 8.2, and 53 ± 8.2 ng/mL, respectively. In summary, this study indicates that vitamin D insufficiency (serum 25D < 30 ng/mL) is prevalent in newborn beef calves, and that potential opportunities exist to improve health of newborn calves through vitamin D supplementation.

Key Words: beef calves, vitamin D, health

W56   Equations to predict chemical body composition in Nellore cattle. A. M. Castilhos[1], R. H. Branco[2], C. L. Francisco*[1], M. E. Z. Mercadante[2], S. F. M. Bonilha[2], C. M. Pariz[1], M. B. Silva[1], and A. M. Jorge[1], *[1]Universidade Estadual Paulista-FMVZ, Botucatu, SP, Brazil, [2]Centro APTA Bovinos de Corte, Instituto de Zootecnia, Sertãozinho, SP, Brazil.*

Multiple linear regressions equations were developed to predict the chemical composition of the empty body of Nellore cattle. Thirty-tree young bulls (Control Nellore, n = 11; Selected Nellore, n = 22) of 339 ± 35 kg initial weight and 448 ± 26 d of age were used. The characteristics used to develop the prediction models were: empty body weight (EBW), age (days), hip height (HH), and ultrasound measurements [backfat thickness (uBF), rump fat (RF) and longissimus muscle area (uLMA)]. Ultrasound measurements were collected at the end of the trial period (d 110). Chemical composition (protein, ether extract, water and ash) was performed on samples obtained after grinding and homogenization of all body tissues. No interaction ($P > 0.05$) was observed between chemical components and genetic groups. Mallows Cp values were close to the ideal value of number of independent variables in the prediction equations plus one. Precise predictions ($R^2 > 0.72$) were obtained for protein, ether extract, and water, whereas poor prediction for ash ($R^2 = 0.67$) was revealed. Protein, ether extract, and water percentage can be calculated using the following equations: % Protein = $52.011 - 1.415 \times RF + 0.179 \times EBW - 32.122 \times HH$ ($R^2 = 0.91$; SE = 2.24); % Ether Extract = $11.300 + 2.096 \times RF + 0.157 \times EBW - 0.061 \times age$ ($R^2 = 0.72$; SE = 4.47); % Water = $-34.156 - 2.327 \times RF + 0.550 \times EBW + 0.103 \times age$ ($R^2 = 0.96$; SE = 5.81). In conclusion, multiple linear regres-

sions were detected between non-invasive measurements and chemical composition of the empty body. The equations developed can be used to estimate chemical body composition characteristics as protein, ether extract and water body percentages of Nellore cattle. Supported by FAPESP Process#2005/60042–2.

Key Words: empty body, equation, Nellore cattle

W57   Effect of maternal body weight gain during mid-gestation on progeny skeletal muscle microRNA. J. C. McCann*, T. B. Wilson, D. W. Shike, and J. J. Loor, *University of Illinois at Urbana-Champaign, Urbana, IL.*

The objectives were to investigate the effects of maternal body gain during mid-gestation on skeletal muscle microRNAs expressed in the progeny. Post-transcriptionally, microRNAs downregulate gene expression by degrading target mRNA or translational repression. Spring-calving, multiparous cows (n = 26) were pen fed a diet consisting of 52% corn silage, 24% soy hulls, and 24% alfalfa haylage for 82 d during mid-gestation. Cows were classified into 3 groups (Hi-gain, Med-gain, and Low-gain) based on BW gain during the feeding period. After calving, all calves were managed similarly as a single contemporary group. Longissimus muscles biopsies were taken on 99, 197, and 392 d of age. Quantitative RT-PCR was used to determine mature microRNA in LM with all reactions run in triplicate. Three reference microRNAs (let-7a, miR-191a, and miR-103) were selected due to stable expression across animals and times. Data were analyzed using the MIXED procedure of SAS with cow BW gain, biopsy time, sex, and sire as fixed effects and pen as the random effect. Pairwise comparisons were implemented to separate means. MiR-381 expression in progeny born to Med-gain BW gain cows was greater ($P = 0.01$) than Low-gain with Hi-gain being intermediate. A cow BW gain × time interaction was observed for miR-181a ($P = 0.02$); while all groups decreased over time, calves from Hi-gain dams were greatest at d 392. A tendency ($P = 0.08$) for a cow BW gain × time interaction was observed for miR-26a. Despite all groups increasing from d 99 to 197, only the Hi-gain group maintained a similar level of miR-26a at d 392 while Med-gain and Low-gain were downregulated. Relative abundance of microRNAs was greatest for known muscle-specific microRNAs, miR-1 and −133a. All measured microRNAs changed ($P < 0.01$) over time. Expression of miR-23a and miR-29a increased with age, while miR-376d and miR-381 decreased at each subsequent time point. Additionally, expression of miR-133a and let-7g was greatest at d 197. Overall, results suggest microRNAs have a role in the robust and coordinated regulation of skeletal muscle development and some may be regulated by epigenetic factors.

Key Words: fetal programming, microRNA, muscle

W58   Physical and chemical analysis of the longissimus thoracis muscle of Nellore cattle selected for production. Jessica Moraes Malheiros*[1], Rogério Abdallah Curi[2], Josineudson Augusto Vasconcelos Silva[2], Henrique Nunes de Oliveira[1], Lúcia Galvão Albuquerque[1], and Luis Artur Loyola Chardulo[2], *[1]College of Agriculture and Veterinary Science, College of Agriculture and Veterinary Science, São Paulo State University (UNESP), Jaboticabal, São Paulo, Brazil, [2]College of Veterinary and Animal Science, College of Veterinary and Animal Science, São Paulo State University (UNESP), Botucatu, São Paulo, Brazil.*

Tenderness is one of the main characteristics in the producer and consumer market. Identifying and selecting beef cattle that have genetic propensity for quality meat production is necessary for zebu animals.

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The aim of this study has been to evaluate the qualitative aspects of meat in *Longissimus thoracis* muscle of 2 selected contrasting groups of 718 Nellore animals finished in feedlot and from herds that are part of breeding programs. Samples were collected between the 12th and 13th ribs to perform the physical-chemical analysis of shear force (SF), rib eye area (REA), backfat thickness (BFT), visual scale of marbling scores (marbling) and cooking losses (Cl). The contrasting groups were selected by SF: animals with tender meat (n = 15) and animals with tough meat (n = 15). Statistical analyzes were performed using the GLM procedure, CORR and the averages were compared using the Tukey test. The values found in the groups of animals with tender meat and animals with tough meat were, respectively to SF (3.8 ± 1.17 and 6.8 ± 1.4 kg), REA (74.8 ± 8.52 and 62.6 ± 6.55 cm^2) and Cl (24.2 ± 3.02 and 28.8 ± 3.81%), showed significant differences ($P < 0.01$). REA has a good relationship with the amount of this muscle in the carcass and thus contributes to the prediction of meat cuts and product yield. Meat with SF values below 5.5 kg may be considered potentially tender. The difference to REA between previously selected groups for meat tenderness establishes the possibility of obtaining Nellore more efficiently in production, coupled with achieving superior products. Samples of tough group showed higher values for Cl, impairing the tenderness. The BFT values (3.4 ± 1.11 and 3.6 ± 0.73 mm) and marbling (2.5 ± 0.24 and 2.5 ± 0.36) for groups of tender and tough meat respectively showed no significant difference ($P > 0.05$). Therefore, in animals of Nellore breed for production the ability to produce meat observed through REA, BFT and marbling, has to be satisfactory. However, the wide variation in SF of the animals selected in breeding programs, sorts the final product with lower added value on meat quality characteristics.

Key Words: quality beef cattle, rib eye area, shear force

W59   Characterization and identification of MyHC and their association with quality beef cattle Nellore. Jessica Moraes Malheiros*[1], Ivan José Vechetti-Junior[2], Maeli Dal-Pai-Silva[2], Henrique Nunes de Oliveira[1], Lúcia Galvão Albuquerque[1], and Luis Artur Loyola Chardulo[3], *[1]College of Agriculture and Veterinary Science, College of Agriculture and Veterinary Science, São Paulo State University (UNESP), Jaboticabal, São Paulo, Brazil, [2]Institute of Biosciences, Institute of Biosciences, São Paulo State University (UNESP), Botucatu, São Paulo, Brazil, [3]College of Veterinary and Animal Science, College of Veterinary and Animal Science, São Paulo State University (UNESP), Botucatu, São Paulo, Brazil.*

The study of myosin protein is directly related to the tenderness, growth, development and muscle contraction, and expresses different isoforms, where the way it operates has great influence on meat quality. This study aimed to relate the Nellore meat (*Bos indicus*) separating 2 contrasting groups through the identification and quantification of heavy chain isoforms of myosin (I, IIa, IIx and IIb). A total of 718 samples of the *Longissimus thoracis* from animals slaughtered in commercial abattoir were used in the shear force analysis (SF) to determine tenderness. According to SF were selected 2 groups: (1) Group of tender meat (n = 15) and (2) Group of tough meat (n = 15) who underwent extraction, identification and quantification of heavy chain isoforms myosin (MyHC) by electrophoresis (SDS-PAGE) and photo documentation of gels. Statistical analyzes were performed using the GLM procedure, CORR and averages were compared using the Tukey test using Statistical Analysis System. For MyHC was identified and quantified 3 isoforms (I, IIa and IIx), the presence of MyHC IIb isoform has not been identified. Mean values of the optical density index (IOD) in relative percentage of MyHC isoforms were observed in the tender meat group and tough respectively MyHC-I (18.2 ± 3.54 and 16.9 ± 3.14), MyHC-IIa (16.7

± 3.09 and 14.0 ± 3.38) and MyHC-IIx (64.9 ± 3.79 and 66.3 ± 5.05). It can be seen a greater amount of type II isoform (fast) compared with type I (slow). There were no differences ($P > 0.05$) between the extreme groups of type I and IIx, unlike IIa ($P < 0.05$), with the highest relative percentage in tender meat group and reported a significant negative association with SF (rp = -0.34; $P < 0.05$). It is concluded from the results that the Nellore have good relationship between the hypertrophy of the *Longissimus thoracis*, as measured by the concentration of MyHC IIa, and meat tenderness, measured by the SF. The study of MyHC isoforms is an appropriate type of muscle fibers identification tool having a good correlation with the meat tenderness feature.

Key Words: quality beef cattle, shear force, skeletal muscle

W60   Effects of pre- and post-breeding supplementation of a ruminally protected lipid on subsequent beef cow performance. Darren D. Henry*[1], Francine M. Ciriaco[1], Vitor R. G. Mercadante[1], Danilo D. Demeterco[1], Pedro L. P. Fontes[1], Elliot Block[2], Neil Michael[2], Nicolas DiLorenzo[1], and G. Cliff Lamb[1], *[1]North Florida Research and Education Center, University of Florida, Marianna, FL, [2]Arm & Hammer Animal Nutrition, Princeton, NJ.*

We determined the effects of supplementation of a ruminally protected lipid (Megalac-R, Church & Dwight Co., Princeton, NJ) on subsequent beef cow reproductive performance. Sixty primiparous cows (428 ± 42 kg of BW) were used in a completely randomized design. Cows were stratified by breed, BCS and the previous year's calving date, and assigned to one of 2 treatments: control (CTRL; 1.36 kg·d^{-1} of corn gluten feed) and treatment (MLAC; 1.36 kg·d^{-1} of corn gluten feed and 0.23 kg·d^{-1} of Megalac-R). Cows grazed a mixed winter forage pasture of rye (*Secale cereale*) and ryegrass (*Lolium multiflorum*) and had ad libitum access to water. Supplementation of CTRL and MLAC occurred from 30 d before AI until 7 d post-AI. Daily, cows were individually penned and received their respective supplementation. Cow BW and BCS were recorded 35 and 28 d before AI and 35 and 60 d after AI. At initiation of the breeding season cows were exposed to the 7-d CO-Synch+CIDR ovulation synchronization protocol. Pregnancy was diagnosed on d 30, 60, and 90 after AI. Cows pregnant to AI were monitored until calving to determine length of gestation and calf birth weight. Treatment did not affect ($P > 0.05$) mean cow BW (491 ± 2.9 kg) or change in cow BW. There was no effect ($P > 0.05$) of treatment on pregnancy rates to AI (53 ± 0.5%) or at 90 d after AI (94.5 ± 0.5%). Length of gestation was greater ($P = 0.0234$) for MLAC (285 ± 1.3 d) than for CTRL (281 ± 1.1 d). No effect of treatment was observed for calf birth weight (34 ± 3 kg; $P > 0.05$). Supplementation of 0.23 kg·d^{-1} of a ruminally protected lipid to primiparous cows did not enhance subsequent cow reproductive performance.

Key Words: ruminally protected, supplementation, beef cow

W61   Effects of prepartum supplementation of a rumen fermentation enhancer on subsequent beef cow performance. Darren D. Henry*[1], Francine M. Ciriaco[1], Vitor R. G. Mercadante[1], Danilo D. Demeterco[1], Pedro L. P. Fontes[1], Elliot Block[2], Neil Michael[2], Nicolas DiLorenzo[1], and G. Cliff Lamb[1], *[1]North Florida Research and Education Center, University of Florida, Marianna, FL, [2]Arm & Hammer Animal Nutrition, Princeton, NJ.*

We determined the effects of a prepartum negative dietary cation-anion difference (DCAD) supplement on subsequent performance of beef cows. Forty-three multiparous cows (568 ± 73 kg of BW) were used in a completely randomized design. Prepartum cows were stratified

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by breed, BCS, and the previous year's calving date and assigned to one of 2 treatments: control (CTRL; 1.75 kg·d^{-1} of 50:50 corn gluten feed (CGF):soybean meal (SBM) mixture, DM basis) and treatment (BCLR; 0.57 kg·d^{-1} of an anion source [Bio-Chlor, Church & Dwight Co., Princeton, NJ] and 1.13 kg·d^{-1} of 50:50 CGF:SBM mixture, DM basis). Cows had ad libitum access to bermudagrass hay (*Cynodon dactylon*) and water. Daily, cows were individually penned and received supplement (CTRL and BCLR were fed for 21.8 ± 9.3 and 24 ± 9.5 d, respectively) until calving. After calving, cows and calves were weighed within 12 h of parturition and blood samples were collected from the cow. Weekly, blood samples were collected from cows, and BW of cows and calves and BCS of cows were recorded. On d 28, 84, and 140 postpartum, milk yield was recorded and milk samples were analyzed to determine energy corrected milk (ECM). Calculated DCAD of CTRL was 469.61 mEq·kg^{-1} DM whereas BCLR was −1295.89 mEq·kg^{-1}. Cow weight and calf weight was not affected by treatment ($P = 0.1154$ and $P = 0.9598$, respectively). The ADG of cows (0.1 ± 0.043 kg), ADG of calves (1.0 ± 0.04 kg), and BCS of cows (4.97 ± 0.05; 1 to 9 scale) was not different between treatments ($P > 0.05$). Similarly, ECM did not differ between CTRL and BCLR ($P > 0.05$). Supplemental DMI was greater ($P < 0.001$) for CTRL (1.60 ± 0.031 kg·$^{-1}$) than for BCLR (1.23 ± 0.033 kg·d^{-1}). Concentrations of plasma Ca (10.67 ± 0.51 mg·dL^{-1}) and β-hydroxybutyrate (173.0 ± 9.18 mmol·L^{-1}) did not differ ($P > 0.05$) between treatments. Prepartum supplementation of 0.57 kg·d^{-1} of an anion source to beef cows did not enhance subsequent cow or calf performance.

Key Words: dietary cation-anion difference, prepartum diet, supplementation

W62   Performance effects related to administration of long-acting eprinomectin or oxfendazole near calving in spring-calving cows over a 230-d grazing period. Elizabeth A. Backes*[1], Jeremy G. Powell[1], Donald S. Hubbell III[2], John D. Tucker[2], William L. Galyen[1], and Laura R. Meyer[1], *[1]Department of Animal Science, Division of Agriculture, University of Arkansas, Fayetteville, AR, [2]Livestock and Forestry Research Station, Batesville, AR.*

Internal parasites have been reported to flourish in Southern states and cause detrimental economic effects to the beef cattle industry. The objective was to evaluate the effects of anthelmintic therapy administered at recommended dose to spring-calving cows approximately 5 d before the initiation of the calving season. Eighty-two (563 ± 8.1 kg) cows located at the Livestock and Forestry Research Station in Batesville, AR, were stratified by BW, BCS, and fecal egg counts (FEC), then allocated randomly to 1 of 3 treatments representing: Control (CON; no anthelmintic administered; n = 27); Oxfendazole (OXF; n = 27); or Long-acting eprinomectin (LAE; n = 28). Cows were rotationally grazed within individual treatment on 2.4-ha mixed grass pastures. Body weight, BCS, FEC were taken on d 0, 14, 91, 154, and 230 and hair coat scores (HCS) taken on d 0, 91, 154. Beginning May 15, 2015, one bull was placed in each pasture for a 60 d breeding season. Performance data were analyzed using PROC MIXED of SAS, with individual cow being the experimental unit and conception rates were analyzed using Chi-squared. Body weight on any sampling date (d 230 BW 568, 573, 574 kg for CON, LAE, OXF, respectively), BCS on d 0, 14, 154, and 230, and HCS on d 0 and 154 did not differ ($P ≥ 0.25$) across treatments; however, BCS were greatest ($P = 0.03$) for OXF (6.0), CON intermediate (5.9), and lowest for LAE (5.8) on d 91, and HCS were greater ($P < 0.01$) for LAE (3.5) versus OXF (1.7) and CON (2.8) on d 91. Similar ($P ≥ 0.16$) overall ADG were reported (0.00, 0.08, and 0.05 kg/d for CON, LAE, OXF, respectively). Cow FEC did not differ ($P ≥ 0.11$) on

d 0 or 91; however, were greater for CON on d 14 and 154 versus OXF and LAE; were greater ($P = 0.02$) for LAE versus CON and OXF on d 230. Conception rates did not differ ($P = 0.17$) across treatments (78, 61, 81%, for CON, LAE, OXF, respectively). In this study, anthelmintic therapy did not improve BW, BCS, HCS, FEC, or conception rate, in spring-calving cows rotationally grazed over a 230-d grazing period.

Key Words: fecal egg counts, spring-calving cows, anthelmintic

W63   The effects of weight gain, carcass characteristics, temperament, and Brahman influence on estrus behavior and conception rate in heifers. Brittney L. Ivey*, Allison C. Vail, William A. Storer, and C. Edward Ferguson, *McNeese State University, Lake Charles, LA.*

Heifers from southwest Louisiana were dry-lotted and evaluated for factors influencing estrus and conception. In October, spring born heifer calves (n = 121, 259 ± 150 kg) were received and processed with routine procedures before beginning a 120 d feeding trial. Heifers were visually assessed for temperament and percentage of Brahman influence. Temperament was evaluated as individual chute scores (CS) and denoted as 1–4 increasing with increased heifer excitability. Temperament was also evaluated as chute exit velocity (EV) using a rodeo event timer to calculate the speed of each animal exiting the squeeze chute. Brahman influence (BI) was determined by the phenotype and/or genotype of the heifers. Criteria for phenotype assessment were ear length and shape, hair type, coat color, and length of sheath. Individual BW and ADG were assessed monthly. Heifers were scanned by ultrasound at d 120 to determine RF, REA, and IMF. Intramuscular fat and RF decreased ($P < 0.05$) in heifers with greater BI. Cattle that were greater than 25% BI had lower ($P < 0.05$) ADG and final BW than did heifers with 0 to 25% BI. During 2 rounds of estrus detection, females were fitted with electronic estrus detection transmitters and monitored for estrus behavior. In round 1 (n = 121), BI did not make a difference ($P > 0.1$) in the duration of estrus or the estrous cycle length. Temperament, as assessed by CS and EV, did not influence ($P > 0.1$) duration of estrus or estrus cycle length. In the second round of estrus detection (n = 59), there was no relationship ($P > 0.1$) between conception and estrous cycle length, duration of estrus, RF, REA, ADG, or BW. Temperament and breed also did not affect ($P > 0.1$) conception rate. This aided in clarifying the relationships of weight gain, carcass characteristics, temperament and BI on estrus behavior and conception rates in heifers.

Key Words: temperament, Brahman, estrus

W64   Effect of breed on the sale price of beef calves sold through video auctions from 2010 through 2014. Michael E. King[1], Kevin L. Hill[2], Glenn M. Rogers[3], and Kenneth G. Odde*[1], *[1]Kansas State University, Manhattan, KS, [2]Merck Animal Health, Kaysville, UT, [3]Grassy Ridge Consulting, Aledo, TX.*

The objective of this study was to quantify the effect of breed description on the sale price of beef calves marketed through video auctions while adjusting for all other factors that significantly influenced price. Information on descriptive characteristics of lots of beef calves were obtained from a livestock video auction service. Data were available on 33,811 lots of calves (3,345,826 total calves) that sold in 116 video auctions between 2010 and 2014. All lot characteristics that could be accurately quantified or categorized were used to develop a multiple regression model that evaluated the effects of independent factors on sale price using a backward selection procedure. A value of $P < 0.05$ was used to maintain a factor in the final model. Breed description of

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the calves in the lot was 1 of 18 factors included in the original model and was categorized into 5 groups: English, English crosses (EX), English-Continental crosses (ECX), Black Angus sired out of dams with no Brahman influence (AN), Red Angus sired out of dams with no Brahman influence (AR), and Brahman influenced (BR). Breed of the lot affected the sale price of beef calves ($P < 0.0001$), and was 1 of 15 independent factors that remained in the final model. The number of lots in each breed group was 3,521, 9,022, 10,744, 1,373, and 9,151 for the EX, ECX, AN, AR, and BR breed groups, respectively. Lots of AR calves sold for a higher price ($P < 0.01$, \$366.32/100 kg) than all other breed groups. Black Angus sired calves had the second highest sale price at \$362.09/100 kg, and this price was higher ($P < 0.01$) compared with the EX (\$359.04/100 kg), the ECX (\$358.36/100 kg), and the BR (\$350.05/100 kg) groups. The EX and the ECX breed groups sold for similar prices ($P = 0.55$), but both of these breed groups sold for higher prices ($P < 0.01$) than the BR lots. Breed composition of lots of beef calves selling through video auctions significantly influenced sale price.

Key Words: beef calves, breed, sale price

W65   Economic aspects of rebreeding non-pregnant cows. Aline Gomes da Silva*[1,2] and Rick N. Funston[1], [1]*University of Nebraska-Lincoln, West Central Research and Extension Center, North Platte, NE,* [2]*Universidade Federal de Viçosa, Viçosa, MG, Brazil.*

A study was conducted to evaluate the economic aspects of retaining ownership and rebreeding open spring-calving cows to be sold as pregnant fall-calving cows. Composite Red Angus × Simmental females diagnosed as non-pregnant after regular spring breeding season were utilized over a 2-yr period (Yr 1, n = 61; Yr 2, n = 72). Hay and supplement were fed from November to February. Cows diagnosed as non-pregnant after a second breeding season were sold in March. Pregnant cows grazed Sandhills meadow pastures until April, when they were sold. Cows were synchronized with a 7-d controlled internal drug release (CIDR)-PG protocol before a 60 d natural service breeding season beginning in November, utilizing a 1:25 bull to cow ratio. Pregnancy diagnosis was determined by ultrasound 30 d after bull removal. A partial budget analysis was performed for Yr 1 to compare the economics of selling non-pregnant cows immediately after pregnancy diagnosis or retaining ownership and rebreeding them to sell as pregnant cows in more favorable market prices. Total cost was calculated by adding the purchase price (cull cow value at first pregnancy diagnosis), feeding costs, meadow grazing and management cost, breeding cost, and 6% annual interest rate on the purchase price. The net cost of 1 pregnant cow was calculated as the difference between total cost and cull value, divided by the number of pregnant cows. The overall rebreeding pregnancy rate was 90.2% for Yr 1 and 81.9% for Yr 2, the percentage of the pregnant cows that conceived in the first 21 d of the breeding season was 89.1% for Yr 1 and 79.7% for Yr 2. The total cost/female was \$1,186.38. Subtracting the cull value of the open cows sold in March, the net cost of one pregnant cow was \$1,185.08. The pregnant cows were sold for \$1,638.00, resulting in a \$452.92 net gain/pregnant cow. While conventional wisdom has held open cows should be sold after pregnancy detection, we conclude rebreeding a non-pregnant cow to be sold at higher market prices may be an economic alternative.

Key Words: budget analysis, cull cow, rebreeding

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