

Beef Species

W15 Performance and carcass alteration of Nellore and F1 Brangus × Nellore steers supplied with organic chromium finished on grass. A. Polizel Neto*¹, A. M. Jorge¹, P. S. A. Moreira², H. F. B. Gomes¹, and R. D. O. Roça¹, ¹São Paulo State University, Botucatu, São Paulo, Brazil, ²Federal University of Mato Grosso, Sinop, Mato Grosso, Brazil.

Chromium works as Glucose Tolerance Factor – GTF, which causes muscle glucose input stimulus. The present work aimed to evaluate the effect of breed and mineral protein supplementation with organic chromium addition on performance and carcass traits in steers finished on grass. 18 Nellore and 18 F1 Brangus × Nellore steers with initial age of 16 months and live weight of 77.31±18.15 kg were used. Two treatments of mineral protein supplementation (22% crude protein, with 0.25 cottonseed meal, 0.25 grind corn and 0.50 commercial mineral supplement) with and without organic chromium addition (2 mg/animal/day of chromium), finished on *Brachiaria sp* grass were assigned. After 14 hours of solid fasting, at initial and final moment, cattle were weighed and calculated the daily weight gain (ADG), on 190 days of experiment. Carcass traits were evaluated by means of ultrasound measurements: rib eye area (REA), subcutaneous fat thickness at the back (between 12th and 13th rib) and at the rump (SFTB and SFTP8). A randomized design was used and all data were analyzed using analysis of variance with two variance source (breed and chromium) using Statistical Analysis System. Regarding ADG, no difference was observed ($P \geq 0.05$) between breeds (means of 457 g/day). On the other hand, animals supplied with chromium showed better ADG (494 g/day) than control animals (420 g/day). Once again, there were no observed differences ($P \geq 0.05$) among experimental treatments in carcass traits measured by ultrasound, reaching final average values of 63.42 cm², 5.46 mm and 5.58 mm, respectively to REA, SFTB and SFTP8. The Nellore and F1 Brangus × Nellore show similar production potential and the mineral protein supplementation with the organic chromium increasing the weight gain, but not influencing the carcass traits.

Key Words: Crossbreed, Mineral, Ultrasound

W16 Carcass and beef traits of Nellore and F1 Brangus × Nellore steers supplied with organic chromium finished on grass. A. Polizel Neto*¹, P. S. A. Moreira², A. M. Jorge¹, H. F. B. Gomes¹, and R. D. O. Roça¹, ¹São Paulo State University, Botucatu, São Paulo, Brazil, ²Federal University of Mato Grosso, Sinop, Mato Grosso, Brazil.

Chromium works as Glucose Tolerance Factor – GTF, which causes muscle glucose input stimulus. This project aimed to evaluate the effect of organic chromium supplementation and of breed on productive carcass traits and some beef quality parameters of steers finished on grass. For this purpose, 18 Nellore and 18 F1 Brangus × Nellore steers were raised on *Brachiaria sp* grass, distributed equally in mineral protein supplementation (22% crude protein, with 0.25 cottonseed meal, 0.25 grind corn and 0.50 commercial mineral supplement) with and without organic chromium addition (2 mg/animal/day of chromium); and were slaughtered at 22 months of age and 451.22±13.22 of shrunk weight. Hot carcass was measured (HCW), and the carcass yield (YC) was calculated by relation of HCW:shrunk weight. Longissimus dorsi muscle pH was measured at 2, 10 and 24 hours post-mortem. After 24 hours of chilling, L. dorsi muscle samples (between 12th and 13th rib)

were collected in order to evaluate the cooking loss, shear force and chemical composition. A randomized design was used and all data were analyzed using analysis of variance with two variance source (breed and chromium), using SAS. Means of 235.01 kg to HCW and 52.09% to YC, with a superiority ($P \leq 0.05$) to chromium treatment (238 kg) versus control (231 kg) were observed, but without difference ($P \geq 0.05$) to YC; neither difference between breeds to HCW and YC. No treatment differences were detected in carcass pH and some quality beef parameter ($P \geq 0.05$) with means of 6.8, 6.2 and 5.7 to pH after 2, 10 and 24 hours, respectively, and cooking loss of 22% and shear force of 6.53 kg/F. The chemical composition was close to normal reference values, with means: 74.01% to moisture, 1.19% to ash, 23.89% to crude protein, 0.9% to ether extract. The Nellore and F1 Brangus × Nellore steers show equal production potential of quality beef on grass. Organic chromium increases the carcass weight, but does not influence the carcass yield or the beef quality parameters evaluated.

Key Words: Crossbreed, Mineral, Supplementation

W17 Estimation of some effects on longevity of beef cows using survival analysis. F. Szabó* and I. Dákay, *University of Pannonia, Keszthely, Hungary.*

Longevity of beef cows measured with the length of productive life from first calving to culling was estimated in this study. Data of 1800 cows belonging to Hereford, Angus, Simmental, Charolais, Limousin and Blonde d'Aquitaine breeds were estimated using Cox regression survival model. The results indicate significant ($P < 0.05$) effect of calving season, calving difficulty, and breed on longevity, however age at first calving of the cows, sex and weaning weight of their calves did not affect ($P > 0.05$) the length of productive life. Hereford had significantly highest (10.28 years) estimated longevity than the other breeds, following by Angus (8.14 years), Simmental (7.88 years), Charolais (7.13 years), Limousine (5.93 years) and Blonde d'Aquitaine (5.2 years). However either Angus, Simmental and Charolais or Limousin and Blonde d'Aquitaine did not differ significantly. Higher productive life (6.23 years) was estimated for cows whose calving took place without assistance or with a little assistance (6.96 years) than those needed veterinary assistance (2.75 years) or had stillbirth (4.63 years). Cows that firstly calved in spring or summer were estimated to reach higher productive life (7.22 years and 9.93 years) and less risk to early culling, then those calving in autumn (5.69 years) and in winter (5.05 years).

Key Words: Breed, Calving Season, Calving Difficulty

W18 Evaluation of MultiMin™ to enhance weaned calf productivity. A. E. Fisher*¹, W. W. Gill³, C. D. Lane, Jr.¹, R. L. Ellis², S. B. Blezinger⁴, and G. M. Pighetti¹, ¹University of Tennessee, Knoxville, ²University of Tennessee, Greeneville, ³Middle Tennessee State University, Murfreesboro, ⁴MultiMin USA, Inc., Sulphur Springs, TX.

This 56-day trial utilized 131 weaned heifers to evaluate the effectiveness of MultiMin™, Ralgro™ and their interaction to overcome mineral deficiencies and poor growth/health status of weaned beef calves in fall 2006. Heifers were randomly allotted to one of four treatments

including 1) Control, no mineral injection, no implant; 2) injection of MultiMin™ (no less than 40 mg/ml zinc, 10 mg/ml manganese, 5 mg/ml selenium and 15 mg/ml copper), no implant; 3) no mineral injection, Ralgro™ (36 mg zeranol) growth promotant; and 4) injection of MultiMin™, Ralgro™ growth promotant. All injections were administered subcutaneously in the neck. Cattle grazed tall fescue dominated pasture and were supplemented with pelleted corn gluten feed at 0.5% average initial body weight. Individual animal weights were recorded on days 0, 1, 28, 55 and 56 and blood was drawn via jugular venapuncture on days 1 and 56 for glutathione peroxidase (GSH-Px) activity analysis. All data were analyzed using the mixed procedure of SAS, with differences determined at $P < 0.05$. Initial weights did not differ among treatments. Average daily gain for MultiMin™ supplemented calves was not different from unsupplemented calves (0.52 vs. 0.52 kg/d, respectively; $P > 0.05$). Ralgro™ administered calves gained more weight than unsupplemented calves (0.55 vs. 0.48 kg/d, respectively; $P < 0.03$). No MultiMin™ by Ralgro™ interaction was observed as any differences can be related to implant. There was no difference in initial GSH-Px activity between groups; however MultiMin™ supplemented calves had higher final GSH-Px activity values than unsupplemented calves (71.8 vs. 54.7 nmol/min/ml; $P < 0.02$). Additionally, the change in GSH-Px activity from day 1 to day 56 was higher for MultiMin™ supplemented calves than unsupplemented calves (29.9 vs. 14.2 nmol/min/ml, respectively; $P < 0.01$).

Key Words: Beef Cattle, Weaning, MultiMin™

W19 Variation of MUFA ratio in several muscles of Japanese Black cattle cloned from somatic cells. Y. Nakahashi*¹, T. Okumura², M. Hada², Y. Fujishima³, K. Yamauchi², S. Hidaka¹, and K. Kuchida¹, ¹Obihiro University of A & VM, Obihiro-Shi, Hokkaido, Japan, ²National Livestock Breeding Center Tokachi Station, Otofuke-Cho, Hokkaido, Japan, ³The Ministry of Agriculture, Forestry and Fisheries of Japan, Chiyoda-Ku, Tokyo, Japan.

Many studies have been performed on the topic of monounsaturated fatty acids (MUFA) because of the positive correlation with the flavor of marbling. However, few studies have investigated the fluctuation of MUFA ratios within finely sliced muscles, especially in Japanese Black (JB) cattle. Our objective was to investigate the changes in fatty acid composition of muscles and specific cuts from JB cloned steers. Five JB steers were cloned from 2 animals and were fed in the same environment until slaughter at 20 mo of age. The following muscles were taken from each animal and sliced at 2cm intervals from the cranial to caudal side: *M.semimembranosus* (SE), *M.quadriceps femoris* and *M.tensor fasciae latae* (QU & TE), *M.supraspinatus* (SU), *M.psoas major* (PS), *M.gluteus medius* and *M.biceps femoris* (GL & BI), *M.longissimus* (LO). LO was classified into 3 parts (Chuck eye: cranial part from the 6-7th rib, Rib roast: from 6-7th to 10-11th rib, Sirloin: caudal part from the 10-11th rib). Carcasses were graded at the 6-7th rib in Japan, and rib roast and sirloin were separated at the 10-11th rib in the meat market. Adipose samples were taken from all slices and analyzed using gas chromatography. The tendencies of fluctuation for the ratios of MUFA and oleic acid differed by muscle, as some increased toward the caudal side while others decreased or remained. GL & BI had the highest ratios of MUFA and oleic acid (54.01 and 49.14%, respectively), whereas PS had the lowest (48.90 and 45.57%, respectively). For each part of LO, sirloin revealed the highest oleic acid and MUFA ratio, but the 6-7th cross section was the lowest. Simple correlations between the 6-7th and the average of all the slices in each muscle were 0.92-0.98 in MUFA.

This may suggest that the MUFA ratio at the 6-7th rib-eye represented the MUFA of the whole carcass.

Key Words: Japanese Black, MUFA Ratio, Muscles

W20 Influence of feed efficiency on profitability of individually fed feedlot cattle. A. L. Shreck*¹, C. O. Trejo¹, J. W. Homm², L. L. Berger¹, and D. B. Faulkner¹, ¹University of Illinois, Urbana, ²Elanco Animal Health, Greenfield, IN.

Data from 828 steers by Simmental or Angus sires (n=47) were analyzed to evaluate effects of feed efficiency on profitability. Cattle were fed corn or corn-byproduct based diets (n=11), and marketed on three strategies: live price, quality based grid (Quality grid), and yield based grid (Yield grid). Cattle were harvested in three groups based on ultrasound data to optimize carcass value. Cattle were stratified by weight and sire then randomly assigned to diets. Individual daily intakes were obtained using the GrowSafe® feeding system (GrowSafe Systems Ltd., Airdrie, Alberta, CA). Five year average price data were collected for feedstuffs, live cattle price (\$85.75/45.4 kg), dressed beef price (\$138.18/45.4 kg), and grid premiums and discounts. Corn price was \$2.63/25.5 kg. Wet corn-byproduct prices were calculated at 90% the value of corresponding dry corn-byproducts (DM basis). Choice-select spread was \$15/45.4 kg for Quality grid and \$12.72/45.4 kg for Yield grid. Discounts were given for hot carcass weight extremes (<250 kg -\$15.82; 432 to 454 kg -\$4.73; >454 kg -\$19.17). Input costs included steer purchase price and feed markup (\$24.2/mt). Veterinary, medical, labor, and transportation costs were \$50/per animal and yardage was \$0.25/d per animal. Steer purchase price was \$121.00/45.4kg based on a 227 kg animal with a \$1.50 slide per 11.3 kg. Days on feed averaged 163.5±22.7 d. Marbling score (MS), hot carcass weights (HCW), and yield grade (YG) were similar across the range of F:G ratios. These data show that small improvements in feed efficiency dramatically improve profitability in feedlot steers

Table 1. Effect of feed efficiency on profitability of feedlot cattle

F:G	n	MS	HCW (kg)	YG	Live*	Quality Grid*	Yield Grid*
<4.50	5	544	370	2.96	103.38	104.56	107.13
4.51-5.0	32	529	381	2.81	90.08	114.59	114.07
5.01-5.50	180	535	381	2.76	65.79	82.13	83.21
5.51-6.0	259	537	384	2.84	45.23	67.26	68.06
6.01-6.50	208	537	384	2.89	20.94	49.02	48.48
6.51-7.0	90	545	381	2.90	-4.19	26.30	24.13
7.01-7.50	40	566	378	2.95	-31.59	-4.71	-7.82
>7.51	14	528	363	2.69	-87.50	-69.24	-66.50

*Profit on a \$/hd basis

Key Words: Feed Efficiency, Steers, Profitability

W21 Characterization of intracellular copper homeostasis regulatory genes in bovine liver. H. Han, T. E. Engle, J. K. Sakugawa, S. L. Archibeque, and K. Partyka*, Colorado State University, Fort Collins.

Copper is an essential trace mineral for growth and development. Copper serves as a cofactor for enzymes involved in a variety of biological

functions. Copper homeostasis within the cell is mediated by the expression of the copper transporter protein (CTR1), ATPase7A (ATP7A), ATPase7B (ATP7B), and Cox17, which help to regulate copper uptake, export and intracellular compartmentalization in non-ruminants. Liver tissue from six Holstein bull calves (average BW 201kg, 7 mo. old) from a previous experiment (25.2mg Cu/kg diet) was utilized to examine the relationship of CTR1 mRNA to ATP7A, ATP7B and Cox17 mRNA expression. Liver samples were collected at the time of harvest and snap frozen. Liver copper concentration was determined via flame atomic absorption and total RNA was extracted from 100mg of liver tissue using TRI reagent and purified using RNeasy. Primers for CTR1, ATP7A, ATP7B and Cox17 were designed for real time PCR analysis. Liver copper concentrations were: 290, 312, 351, 354, 611, and 801 mg of Copper/kg DM. Real time PCR analysis of these genes revealed that relative expression of CTR1, was positively correlated with ATP7A ($r=0.90$; $P < 0.02$), ATP7B ($r=0.98$; $P < 0.01$) and Cox17 ($r=0.94$; $P < 0.01$) gene expression at all copper concentrations. These data indicate that genes involved in bovine liver copper homeostasis, ATP7A, ATP7B and Cox17 are correlated with CTR1 gene expression in the bovine liver which is similar to those reported for non-ruminants.

Key Words: Copper, Liver, Gene Expression

W22 Evaluation of methods to estimate individual intakes of cattle fed in group pens. G. D. Cruz*, J. W. Oltjen, and R. D. Sainz, *University of California, Davis.*

Feed efficiency measures such as residual feed intake (RFI) require individual determination of intake, a laborious and expensive process. Several methods developed to predict individual intakes in group pens were evaluated with a dataset of 60 Angus x Hereford steers. Models 1 (Perry and Fox (1997) *J. Anim. Sci.* 75:300) and 2 (Guiroy et al. (2001) *J. Anim. Sci.* 79:1983) are based on growth, carcass composition and nutrient requirements. Model 3 is based on solution of simultaneous equations and the heterogeneity of subgroups through a rotational system (Trovo et al. (2006) *Proc. Soc. Bras. Zootec.*). Steers (296 kg initial BW) were fed a corn-based ration (1.68 Mcal NEm/kg, 13% CP on a DM basis) twice daily and refusals were measured daily. Animals were stratified by BW and placed in 30 individual pens and five group pens (six animals each). Every day three steers from each group pen were randomly transferred to another group pen. After 60 days, animals were switched from group to individual pens and vice versa for another 60 days. Average daily individual intakes (in group pens) were estimated by multiplying each animal's average daily individual intake (in individual pens) by an adjustment factor which was calculated as the ratio between the mean intakes in individual and group pens for the same group of animals. Models 1 and 2 used the combined pen data as input, and Model 3 used the daily rotation data. The Mean Square Errors of Prediction (MSEP) were 4.56, 3.71 and 3.29 kg/d for Models 1, 2 and 3, respectively. The decomposition of the MSEP indicated different patterns in the errors of prediction between models. For Model 3, random error accounted for nearly 60% of the MSEP, whereas for Models 1 and 2 the slope bias accounted for more than 50% of the errors of prediction. Considering that mean RFI values for high and low RFI groups are typically around 1 kg/d above or below zero respectively, none of these models predicted intake with the precision required for estimation of RFI. At present there is no substitute for measuring individual intakes.

Key Words: Cattle, Feed Intake, Models

W23 Carcass characteristics of Alabama calves fed in four regions of the United States. W. C. Rutherford, J. B. Elmore, S. V. Free, J. K. Grubbs*, M. Hittle, and L. A. Kriese-Anderson, *Auburn University, Auburn.*

Carcass data were collected from 10,778 calves enrolled in the Alabama Beef Connection Program (ABC) from 2003 to 2007. Calves were enrolled by 78 different producers. Calves were fed in Midwestern ($n=2116$), Northern High Plains ($n=6033$), Southern High Plains ($n=2140$) or Western ($n=487$) commercial feedyards. Calves were fed diets traditional to the feedlot and region. All traits were analyzed using the generalized linear models procedure in SAS. Traits analyzed included average daily gain (ADG), hot carcass weight (HCW), 12th rib backfat (BF), longissimus dorsi area (REA), USDA marbling score (MS) and USDA yield grade (YG). Independent variables in the model included year, feeding region and year by feeding region interaction. The interaction was non-significant ($P>0.05$). Compared to the 2000 Beef Quality Audit, Alabama calves were similar to audit values for HCW and BF. Alabama calves had more muscle, which translated into lower YG. MS averages for Alabama calves were lower (489 vs. 523) than 2000 audit averages. However, of Alabama calves grading USDA choice, 43% ($n=2167$) qualified for quality branded beef programs. Since 2003, HCW of Alabama calves trended down ($P<0.10$) with less BF and more MS. Additionally YG held constant from 2003 to 2007 while REA trended upward.

Table 1. Growth and carcass LSMeans by feeding region

Trait	Midwest	No. High Plains	So. High Plains	Western
ADG (kg/d)	1.27 ^b	1.27 ^b	1.33 ^a	1.24 ^c
HCW (kg)	360 ^a	358 ^a	372 ^b	367 ^b
BF (mm)	12.2 ^c	11.9 ^c	9.4 ^a	11.2 ^b
REA (cm ²)	85.2 ^d	87.1 ^c	94.2 ^a	91.6 ^b
MS ¹	480 ^b	489 ^a	458 ^c	490 ^a
YG	2.5 ^b	2.5 ^b	2.2 ^a	2.4 ^b

¹ 400 = Select⁺; 450 = Select⁺; 500 = Choice⁺. Rows with different subscripts are significantly different at $P<0.05$ level

Key Words: Beef, Carcass, Beef Quality Audit

W24 Relationship between residual feed intake and reproductive performance in Brangus heifers. P. A. Lancaster*¹, G. E. Carstens¹, P. Chen¹, D. W. Forrest¹, T. H. Welsh, Jr.¹, R. D. Randel², and T. D. A. Forbes², ¹Texas A&M University, College Station, ²Texas AgriLife Research, Overton, TX, ³Texas AgriLife Research, Uvalde, TX.

The objective of this study was to examine the relationships between residual feed intake (RFI) and reproductive traits in heifers. Average (\pm SD) initial age and BW of Brangus heifers (Camp Cooley Ranch) were 225.8 \pm 9.1, 236.0 \pm 10.7 and 235.6 \pm 14.6 d, and 285.1 \pm 28.0, 268.5 \pm 23.8 and 267.8 \pm 25.8 kg for year 1 (N = 114), 2 (N = 115) and 3 (N = 119), respectively. Heifers were individually fed a roughage-based diet (ME = 1.98 Mcal/kg DM) for 70 d. RFI was calculated as the difference between actual DMI and expected DMI from linear regression of DMI on mid-test BW^{0.75} (MBW), ADG, year and year by MBW and ADG interactions (year and year by MBW and ADG interactions were considered random effects). Weekly blood samples were assayed in duplicate for progesterone by RIA (Diagnostic Systems Laboratories). Heifers exhibiting a progesterone concentration \geq 2 ng/mL for one wk or \geq 1 ng/mL for two consecutive wk were considered pubertal. Overall

ADG, DMI and RFI were 0.90 ± 0.15 , 9.10 ± 1.11 and 0.00 ± 0.75 kg/d, 1.06 ± 0.16 , 9.47 ± 1.04 and 0.00 ± 0.68 kg/d, and 1.00 ± 0.13 , 9.92 ± 1.06 and 0.00 ± 0.70 kg/d for year 1, 2 and 3, respectively. Heifers with low RFI (< 0.5 SD) had 16% less ($P < 0.01$) DMI and 15% lower ($P < 0.01$) feed conversion ratio than heifers with high RFI (> 0.5 SD), even though ADG and final BW were similar. RFI was correlated with gain in fat thickness (0.27). Across the 3 years, 30% of the heifers were pubertal by d 70. Chi-square analysis revealed that the percentage of pubertal heifers by d 70 within low (32.1%), medium (28.3%) and high (29.6%) RFI phenotypes was similar ($P = 0.80$). Of those heifers that were pubertal by day 70, age at puberty was similar ($P > 0.20$) between low (279 d), medium (273 d) and high (271 d) RFI phenotypes. After returning to Camp Cooley Ranch 18, 18 and 16 heifers with low, medium and high RFI were sold prior to the breeding season. Rectal palpation results indicated that pregnancy rates were similar ($P = 0.17$) for heifers with low (89.4%), medium (85.7%) and high (79.3%) RFI. These results indicate that postweaning RFI was not phenotypically associated with age at puberty or pregnancy rate in Brangus heifers.

Key Words: Residual Feed Intake, Reproduction

W25 Fatty acid profile, meat cholesterol and total lipids of *Bos indicus* based types bullocks fed monensin or polyclonal antibodies against lactate-producing rumen bacteria. M. V. Fossa^{1,2}, R. D. L. Pacheco^{*1,2}, D. D. Millen^{1,2}, T. M. da Cunha Leme¹, M. P. de Oliveira¹, C. R. de Oliveira¹, A. E. Mathias¹, J. C. Hadlich¹, A. DiCostanzo³, N. DiLorenzo³, M. De Beni Arrigoni¹, C. L. Martins¹, M. Parrili¹, and S. A. Matsuhara¹, ¹FMVZ/UNESP, Botucatu, São Paulo, Brazil, ²Supported by FAPESP, São Paulo, São Paulo, Brazil, ³University of Minnesota, Saint Paul.

Our objective was to study the effect of biotype [GG; Nellore (NE), Canchim (CC- 5/8 Charolais, 3/8 Nellore) and 3-way cross (1/2 Brangus, 1/4 Nellore and 1/4 Angus)] and feed additive [FA; 300 mg of monensin/day (MO) or 10ml of polyclonal antibody preparation against lactate-producing rumen bacteria/day (PAP)] on fatty acid profile of subcutaneous fat (FP) and cholesterol (CO) and total lipids (TL) of *Longissimus dorsi* muscle. Two bullocks (260 kg) were randomly selected from a population of four in each of 18 pens allocated to the 2 X 3 factorial arrangement of FA and GG. Samples were collected from the longissimus dorsi muscle between the 12th and 13th rib. The fatty acid profile of subcutaneous fat was from total lipids and determined by gas chromatography. No difference ($P > 0.05$) was found for miristic acid between all treatments. Palmitic acid (C16:0) was found in greater concentrations ($P < 0.05$) in steaks from bullocks fed MO (255.95 vs 243.76 mg/g) and in lower concentrations in NE bullocks (229.82 vs. 264.30, 255.44 mg/g for NE, CC, and TC). No differences ($P > 0.05$) were found for stearic acid due to either GG or FA. Oleic acid (C18:1) was affected ($P < 0.05$) by GG (474.37 vs. 423.11, 420.43 mg/g for NE, CC, and TC, respectively) but not by FA ($P > 0.05$). Linoleic (C18:2) acid was not affected ($P > 0.05$) by GG or FA. Steaks from NE had greater concentration ($P < 0.01$) of CLA (C18:2, c-9, t-11; 5.79 vs. 3.23 and 3.68 mg/g for NE, CC and TC). Linolenic acid (C18:3, Ω 3) did not differ ($P > 0.05$) due to GG or FA. Steaks from NE had lower ($P < 0.01$) saturated fatty acid concentration (414.86 vs. 479.49, 485.65 mg/g or 42.09% vs 48.48%, 49.13% for NE, CC and TC). There was no FA or GG effects ($P > 0.05$) for CO and TL in meat. Steaks from NE had greater concentrations of (C18:1), (CLA) and lower concentrations of saturated fatty acids and (C16:0).

Key Words: PAP, Fatty Acid Profile, Cholesterol

W26 Evaluation of growth, carcass characteristics and meat tenderness of bullocks fed monensin or polyclonal antibodies against lactate-producing rumen bacteria. R. D. L. Pacheco^{*1,2}, D. D. Millen^{1,2}, T. M. da Cunha Leme¹, C. R. de Oliveira¹, A. E. Mathias¹, J. C. Hadlich¹, A. DiCostanzo³, N. DiLorenzo³, M. De Beni Arrigoni¹, C. L. Martins¹, S. A. Matsuhara¹, M. Parrili¹, M. V. Fossa¹, J. P. S. T. de Bastos¹, T. M. Mariani¹, ¹FMVZ/UNESP, Botucatu, São Paulo, Brazil, ²Supported by FAPESP, São Paulo, São Paulo, Brazil, ³University of Minnesota, Saint Paul.

The objective of this study was to evaluate effects of feed additive (300 mg of monensin/day, MO, vs 10 mL of polyclonal antibody preparation against lactate-producing bacteria/day, PAP) or biotype (Nellore, NE, Canchim cross, 5/8 Charolais, 3/8 Nellore, CC, or a 3-way cross, 1/2 Brangus, 1/2 Nellore and 1/2 Angus, TC) on ultrasound (US)-assessed measures of fat and ribeye area, carcass characteristics, and *Longissimus dorsi* tenderness (shear force, SF, and myofibrillar fragmentation index, MFI) of bullocks fed high-concentrate diets. Two bullocks (259.6±26.39 kg) were randomly selected from a population of four in each of 18 pens allocated to the 2 X 3 factorial arrangement of feed additive (FA) and biotype (GG), and monitored monthly for a 107-d (CC and TC) or 147-d (NE) feeding period. Analyses of variance included the initial measurement covariate when appropriate ($P < 0.05$) were used. Final (BW) and hot carcass weight (HCW) were unaffected ($P < 0.05$) by FA, but were lower ($P < 0.05$) for NE than CC and TC. Dressing percentage (DP) was lower ($P < 0.05$) for TC than NE and CC bullocks. An interaction between FA and CC ($P < 0.05$) revealed that TC bullocks fed MO had greater ($P < 0.05$) DP than TC bullocks fed PAP (51.6% vs 54.0% TC bullocks fed MON vs those fed PAP). There was no effect ($P > 0.05$) of FA on monthly measurements of fat depth (BFT), rump fat (P8), ribeye area (REA), or visceral fat (VF), SF and MFI. Bullocks of CC biotype were leaner ($P < 0.05$; less BFT and P8) than those of TC and NE biotypes. Bullocks of NE biotype had smaller ($P < 0.05$) REA than those of CC and TC biotypes. Steaks of TC biotype had lower ($P < 0.05$) SF values than those of the other biotypes. There were no differences ($P > 0.05$) in MFI or VF due to biotypes. Other than effects of PAP on TC biotype, PAP did not affect carcass fat, REA or tenderness.

Key Words: Antibodies, Growth, Tenderness

W27 Evaluation of the acute phase response in the neonate bovine model following vaccination against bovine respiratory disease complex. W. J. Horne^{*1}, K. S. Barling², J. A. Carroll³, A. D. Herring¹, G. A. Holub¹, and J. E. Sawyer¹, ¹Texas A&M University, College Station, ²Novartis Animal Health US, Inc, Larchwood, IA, ³USDA-ARS, Lubbock, TX.

A study using 7-d old Holstein calves was conducted to determine the effects of viral vaccination on febrile and pro-inflammatory cytokine responses in the neonate. Calves were treated with a multi-valent modified live virus vaccine (Arsenal 4.1[®], n = 3; **ML**) or a multi-valent killed virus vaccine (ViraShield 6[®], n = 3; **KV**) within a week of birth at label dosage. Blood samples and rectal temperatures (**RT**) were collected 1 h before, hourly for 12 h, at 18, 24, 30, 36, 48, 60, and 72 h after vaccines were administered. Serum was analyzed for tumor necrosis factor- α (**TNF- α**), interferon- γ (**IFN- γ**), interleukin 1- β (**IL-1**), **IL-2**, **IL-4**, and **IL-6**. Responses were evaluated as difference from baseline within calf. Data were analyzed as repeated measures with calf as the subject. Time influenced ($P < 0.1$) all responses except serum IL-4 ($P = 0.18$). Peak increases in TNF- α , IL-6, and IFN- γ occurred at 24 h, with IFN- γ

falling below baseline at 48 h; IL-6 remained elevated through 60 h. Increased IL-2 was observed at 0, 30, 36, 60, and 72 h after vaccination. Treatment by time interactions occurred for RT ($P = 0.04$) and IL-1 ($P = 0.05$). After 6 h, all calves had elevated RT, but the magnitude of increase was greater for calves receiving ML than those receiving KV. Increase in IL-1 was of greater magnitude in the first 12 h for calves receiving KV, but returned to baseline after 24 h. For those receiving ML, IL-1 increased at 5 and 6 h, returned to baseline, then increased after 30 h. Animals receiving ML had greater increases ($P = 0.07$) in serum IL-4

concentrations than those receiving KV. However, KV induced greater ($P = 0.02$) increases in IL-6. While both vaccines stimulated cytokine production, the associated febrile response was not strongly correlated with the release of any specific cytokine. Our results demonstrate that different vaccines have differential effects on the magnitude and timing of release of various cytokines. Understanding these differences and immunological sequelae to cytokine release may enhance development of vaccination strategies.

Key Words: Cattle, Acute Phase Response, Vaccine