

Meat Science and Muscle Biology I

W302 Effect of rib fat thickness on meat quality attributes of Nellore young bulls. E. E. Dall'Antonia, J. F. Lage*, L. R. Simonetti, E. San Vito, E. A. Oliveira, M. Machado, L. M. Delevatti, M. B. Abra, and T. T. Berchielli, *Universidade Estadual Paulista, Jaboticabal, Sao Paulo, Brazil.*

The objective of this study was to evaluate the effect of rib fat thickness (RFT) on ultimate pH, lean and fat color, water-holding capacity (WHC), Warner-Bratzler shear force (WBSF), cook loss (CKL) of 14 young Nellore bulls. Bulls were housed in individual stalls and fed a diet containing 40% corn silage and 60% concentrate (grounded corn, soybean meal, urea/ammonium sulfate, mineral mixture). Bulls were slaughtered at 17 mo of age and carcasses chilled at 0°C for 24 h. Carcasses were ribbed between the 12 - 13th ribs and separated into 2 groups by RFT: 3 - 6 mm (7 carcasses) and 6.1 - 10 mm (7 carcasses). Longissimus dorsi (LD) section (10 cm thick) was removed from the posterior end of the wholesale rib. LD samples and subcutaneous fat were individually vacuum-packaged and held at -20°C for analysis. The color reading was conducted on the surface of lean or fat, using the CIE L*a*b* system. The WHC was measured for the difference between the weights of the sample before and after it was subjected to a pressure of 10 kg for 5 min. Data were analyzed by the GLM procedure of SAS, and the Tukey test used considering 5% probability. The RFT did not affect the pH ($P = 0.91$). Similar lightness (L^* ; $P = 0.77$), redness (a^* ; $P = 0.99$) and yellowness (b^* ; $P = 0.81$) were observed for beef from carcasses with different rib fat thickness. Regarding the subcutaneous fat color, similar L^* ($P = 0.37$), a^* ($P = 0.94$) and b^* ($P = 0.47$) were observed from carcasses with different RFT. The carcasses with RFT (3 - 6 mm) had lower WHC ($P = 0.01$) than carcasses with RFT >6.1 mm. The RFT did not affect the WBSF ($P = 0.77$) and CKL ($P = 0.80$). Carcasses with rib fat thickness lower 6.1 mm have lower water holding capacity. The rib fat thickness over 3.0 mm did not affect the tenderness, pH, color or cook loss in carcasses from young Nellore bulls.

Key Words: beef, color, tenderness

W303 Fatty acid profile and sensory analysis of meat from Nellore steers fed with different levels of whole raw soybeans. N. R. B. Cônsolo*, A. S. C. Pereira, R. Gardinal, J. E. Freitas Junior, J. R. Gandra, C. S. Takiya, F. P. Rennó, and G. D. Calomeni, *Universidade de São Paulo, Pirassununga, São Paulo, Brazil.*

The aim of this work was to evaluate the fatty acid profile and sensory analysis of meat from Nellore steers treated with different concentrations of whole raw soybean (WRS) into their diet. Fifty-four animals with mean weight and age of 350 kg and 24 mo were fed for 84 d with 4 isoproteic diets of 15% crude protein as follows: T0, with 0% of WRS, T8, with 8% of WRS, T16, with 16% of WRS and T24, with 24% WRS. These diets contained 2.0, 3.5, 4.9 and 6.4% of fat content, respectively. Steers were allotted to 4 pens and assigned to a completely randomized design. Animals were slaughtered and 24 h later, samples of the Longissimus muscle were collected from the left half-carcass between the 12th and the 13th ribs. Two samples were collected from each animal. Samples were identified and vacuum stored in polyethylene bags and aged for 14 d with temperature varying between 0°C and 4°C for determination of fatty acid profile and sensory analysis. Fatty

acids were extracted and quantified by chromatography (GC Shimadzu 2010). Sensory evaluation was assessed by a panel of 10 trained tasters (American Meat Science Association, 1995). The steaks were cooked until the internal temperature of meat reached 71°C then sliced and served to each member of the panel. Statistical analysis was conducted by SAS software. The results showed that fatty acids highest scores were C18:1 c9, C16:0 and C18:0. No difference ($P > 0.05$) was observed for the C18:2, C18:3 total fatty acids saturated, unsaturated and the unsaturated/saturated. However, the fatty acid C14:0 and C16:1 content presented an inverse correlation with WRS levels ($P = 0.05$ and $P = 0.006$). On the other hand, fatty acid C20:0 and C20:2 showed a positive correlation ($P = 0.039$ and $P = 0.001$). Regarding sensory analysis, no effect was observed ($P > 0.05$) for juiciness, flavor, characteristic flavor and off flavor. Interestingly, animals feed with 24% of WRS presented more tender meat than controls ($P < 0.05$). Including 24% of WRS in diet presented a slight improvement in the fatty acid profile and meat tenderness from Nellore steers

Key Words: protein source, meat quality, ruminant

W304 Using near-infrared reflectance spectroscopy to predict chemical composition with a wide range of variability in beef. H. W. Su*, K. Sha^{1,2}, L. Zhang^{1,3}, Q. Zhang⁴, Y. L. Xu^{1,3}, R. Zhang⁵, H. P. Li¹, and B. Z. Sun¹, ¹*Institute of Animal Science, Chinese Academy of Agricultural Sciences, Beijing, China,* ²*College of Food and Wine, Yantai Research Institute of China Agricultural University, Yantai, Shandong, China,* ³*Department of Food Science and Engineering, Gansu Agricultural University, Lanzhou, Gansu, China,* ⁴*Department of Animal Sciences, Purdue University, West Lafayette, IN,* ⁵*Beijing Zhongnong Boya Technology Development Co. Ltd., Beijing, China.*

The objective of this study was to develop near infrared reflectance spectroscopy (NIRS) models for predicting the chemical composition with a wide range of variability in beef. In total, 182 samples (168 samples from specific carcass and additional 14 artificially mixed samples with high proportion of fat tissue) were minced and divided into calibration set ($n = 140$) and independent validation set ($n = 42$). Reference values had extremely wide ranges of fat (0.20–86.45%, mean 10.04%), protein (1.98–23.28%, mean 19.42%) and moisture (12.85–78.53%, mean 69.92%). Reflectance spectra (1000–1800 nm) were collected, and then calibration models were built using partial least squares regression (PLSR) on the calibration set of samples. Different mathematical pre-treatments were tested and either multiplicative scatter correction (MSC) or mean centering (MC) combined with the 1st derivative gave the best calibration models for different chemical composition. According to the selected calibration equations, both the coefficient of determination in calibration (R^2_c) and the coefficient of determination in prediction (R^2_p) was over 0.98 for all chemical composition, and the ratio performance deviation (RPD) was 17.37, 5.12 and 10.43 for fat, protein and moisture, respectively (Table 1). The results of the present study indicate the outstanding ability of NIRS to predict chemical composition in beef from different cattle breeds, which is probably due to the wide ranges of reference data and the homogeneity in minced beef samples. To our knowledge, performances of the calibration equations have never been so high to offer an alternative to analytical methods of the chemical composition in beef.

Table 1. Statistics of prediction models for chemical parameters in beef samples by NIRS¹

Item	Mathematical treatment	No. of latent factors	Calibration set		Validation set		
			R ² C	SEC	R ² P	SEP	RPD
Fat	MC + 1st derivative	9	0.998	0.940	0.998	0.986	17.37
Protein	MSC + 1st derivative	10	0.984	0.654	0.981	0.746	5.12
Moisture	MC + 1st derivative	9	0.997	1.017	0.995	1.246	10.43

¹SEC = standard error of calibration; SEP = standard error of validation.

Key Words: NIRS, beef, chemical composition

W305 Effects of anti-gonadotropin-releasing factor (GnRF) vaccine and band castration on carcass quality in beef cattle under North American management practices. S. Marti^{*1,2}, M. Devant², S. Amatayakul-Chantler³, J. A. Jackson⁴, E. D. Janzen⁵, and K. S. Schwartzkopf-Genswein¹, ¹Agriculture and Agri-Food Canada, Lethbridge, Alberta, Canada, ²IRTA-Ruminant Production, Caldes de Montbui, Barcelona, Spain, ³Veterinary Medicine R&D, Zoetis, Parkville, Victoria, Australia, ⁴Veterinary Medicine R&D, Zoetis, Kalamazoo, MI, ⁵University of Calgary Veterinary Medicine, Calgary, Alberta, Canada.

Angus bulls (n = 60; 257 d of age; initial BW 358.8 ± 3.98 kg) were used to study the effect of an Anti-Gonadotropin-Releasing factor (anti-GnRF) vaccine and band castration on carcass quality. Cattle were randomly assigned to 1 of 3 treatments: Bulls, band-castrated animals without pain mitigation (castrated), and animals administered an anti-GnRF vaccine Bopriva (Zoetis, Parkville, Australia, vaccinated). Animals were randomly assigned to one of 6 pens (10 animals/pen). Three doses of 1 mL of anti-GnRF were administered via subcutaneous injection on d -35, 0 and 90, and band-castration was performed on d 0. Animals were harvested at 514 ± 5.2 d of age, and hot carcass weight (HCW), average fat, ribeye area, marbling quality and percent saleable meat were measured. Data were analyzed using a mixed-effects model with treatment as the main and pen as a random effect. No differences ($P > 0.05$) were observed between castrated and vaccinated steers in final BW (680 ± 8.0 vs. 678 ± 8.0 kg, respectively) and carcass weight (400 ± 5.1 vs. 401 ± 5.1 kg, respectively), however, bulls had greater ($P < 0.001$) final BW and HCW (764 ± 8.0 and 469 ± 5.1 kg, respectively) than castrated and vaccinated animals. Ribeye area (100.9 ± 1.52, 84.2 ± 1.52, and 86.8 ± 1.52 cm², for bulls, castrated and vaccinated), and percent saleable meat (53.9 ± 0.79, 49.3 ± 0.79, and 50.2 ± 0.79%, for bulls, castrated and vaccinated) were greater in bulls than in castrated and vaccinated steers. However, average subcutaneous fat (16.7 ± 0.97, 21.1 ± 0.97, and 20.6 ± 0.97 mm, for bulls, castrated and vaccinated) and marbling were greater in castrated and vaccinated steers compared with bulls, with marbling levels numerically greater in vaccinated than castrated steers. These data suggest that an anti-GnRF vaccine (Bopriva) does not negatively affect growth performance or carcass quality making it a viable animal welfare-friendly alternative to traditional banded castration.

Key Words: carcass quality, anti-GnRF vaccine, band castration

W309 Meat characteristics of lambs fed fresh or dehydrated spineless cactus (*Opuntia ficus-indica*). M. I. Aguilar-Yanez¹, O. Hernandez-Mendo¹, G. Aranda-Osorio^{*2}, I. Guerrero-Legarreta³, and M. M. Crosby-Galvan¹, ¹Colegio de Postgraduados, Montecillo,

Mexico, ²Universidad Autonoma Chapingo, Texcoco, Mexico, ³Universidad Autonoma Metropolitana, Iztapalapa, Mexico.

The objective of this study was to evaluate meat characteristics and fatty acid profile from finishing lambs supplemented with fresh or dehydrated spineless cactus (*Opuntia ficus-indica*). Twenty-seven commercial crossbred male lambs were used, with an initial liveweight mean of 21.4 ± 3.8 kg. They were distributed homogeneously into 3 groups of 9 each, allocated in individual pens, and then randomly assigned to one of the following treatments: (T1) Control diet, (T2) Diet with 17% of dehydrated cactus (dry matter), and (T3) Diet with 17% of fresh cactus (dry matter). Crude protein, ash and fat content, color, shear force of raw and cooked meat, water activity (Aw), holding water capacity (HWC) and fatty acid profile were evaluated in the muscle Longissimus dorsi. A completely random design using Proc GLM was used, and when statistical differences were observed, a mean comparison was done using the Tukey test. There were differences in water-holding capacity ($P < 0.001$) and behenic fatty acid ($P < 0.005$), being lower and higher on T1 and T2, respectively. Meat chemical analysis, color and shear force, were not different ($P > 0.05$) among treatments, neither were the percentage of total fatty acids, saturated, monounsaturated and polyunsaturated. These results suggest that including cactus (fresh or dehydrated) into the lamb finishing diet at around 17% of the dry matter, had similar benefits on meat quality than that without cactus (a common finishing diet); or even in fatty acid profile, which makes cactus a viable feeding strategy. It seems that the level of cactus pear could be increased in the diet without affecting animal performance and to have a positive effect on sheep meat, in particular, enhancing the fatty acid profile.

Key Words: sheep, cactus pear, meat trait

W310 Effect of fat source addition on the profile of main fatty acids in the longissimus muscle and subcutaneous fat of feed-lot steers. G. Fiorentini^{*1,2}, I. P. C. Carvalho^{1,2}, J. F. Lage^{1,2}, L. G. Rossi^{1,2}, L. Delevatti¹, C. S. Ribeiro Junior¹, and T. T. Berchielli^{1,3}, ¹Universidade Estadual Paulista (UNESP) - FCAV, Jaboticabal, SP, Brazil, ²Fundação de Amparo à Pesquisa do Estado de São Paulo (FAPESP), São Paulo, SP, Brazil, ³Instituto Nacional de Ciência e Tecnologia em Ciência Animal (INCT-CA), Brasília, DF, Brazil.

The aim of this experiment was to evaluate the effect of addition of fat sources on fatty acid composition of the longissimus muscle and subcutaneous fat of steers. Forty-five Nellore steers with an initial average age of 15 mo and an initial body weight of 419 kg were used in this study. The diet was provided ad libitum with a forage (corn silage): concentrate ratio of 60:40. Five different concentrates were formulated for each treatment: without additional of a fat source (WF) (2.8% ether extract in the total diet) or with addition lipids of different fatty acid profiles: linseed oil (LO), palm oil (PO), soybeans (SG) and a commercial supplement with protected fat (Lactoplus) (PF) with 7.0% ether extract on a total dietary. The experimental period was 90 d and the experiment was set up as a completely randomized design. After slaughter, samples were taken from the longissimus muscle and subcutaneous fat (between the 12th and 13th rib) for the measurement of fatty acid concentration. The means were compared by the Tukey test at 5%. Palm oil diet increased the concentration of C14:0 in the muscle and subcutaneous fat ($P < 0.05$) when compared with the other diets (5.18 and 6.99%, respectively). The concentration of C16:0 in the muscle was higher in the diet WF (26.3%) and lower in animals fed with the diet with LO (22.2%). For subcutaneous fat, in addition to the treatment WF (24.1%), the treatments that contained PO (24.7%) and PF (23.5%) also showed higher C16:0 concentration when compared with LO (18.7%) ($P < 0.05$). The highest amount of oleic on the muscle

was obtained in WF (40.2%), whereas PO and PF showed lowest concentrations (34.0 and 33.8%, respectively). The highest level of linoleic was verified in animals fed PF (4.91%). Concentrations of linolenic and CLA were found at a higher percentage in the muscle and fat of animals fed with LO when compared with the others ($P < 0.05$). Diet with LO provided greater concentrations of CLA in the longissimus muscle and subcutaneous fat of Nellore cattle, improving beef quality. Using PO as a fat source elevated the amount of undesirable saturated fatty acids.

Key Words: linseed oil, meat quality, palm oil

W311 Fatty acid profile of meat from Nellore young bulls fed crude glycerin replacing energy sources on concentrate. J. F. Lage*, E. San Vito, A. F. Ribeiro, R. A. Silva, E. E. Dallantonia, L. R. Simonetti, L. M. Delevatti, R. A. Reis, and T. T. Berchielli, *Universidade Estadual Paulista, Jaboticabal, Sao Paulo, Brasil*.

This trial aimed to evaluate the effects of feeding crude glycerin (CG; 80% glycerol) included on 10% of DM diet, replacing corn (Cr) or soybean hulls (Sh) in different ratio of concentrate:roughage (60:40 or 40:60) on fatty acid profile of meat from young bulls. Sixty young bulls (Nellore), with 374.11 ± 24.77 kg initial BW were randomly assigned to 6 treatments, with 10 replicates. The diets were (1) without CG plus Cr; (2) combination of CG and Cr, (3) combination of CG plus Sh. These 3 diets were combined with 2 concentrate levels (CL; 60:40 or 40:60), resulting in 6 diets. The diets were isonitrogenous. Animals were slaughtered at 498.35 ± 33.55 kg BW and all carcasses were refrigerated at 0°C for approximately 24 h. A boneless longissimus muscle (LM) section 10 cm thick was removed from the posterior end of the wholesale rib. LM samples were individually vacuum-packaged and held at -20°C for analysis. The experiment was conducted according to a completely randomized design in a 2×3 factorial arrangement: 2 CL \times 3 feeding regimens (FR). Data were analyzed by the GLM procedure of SAS, and the Tukey test used considering 5% probability. Meat from animals fed lower CL had greater ($P = 0.0184$) level of palmitic acid (C16:0), myristoleic acid ($P = 0.0218$) and palmitoleic acid ($P = 0.0026$) compared with meat from animals fed greater CL. Greater levels of stearic acid ($P = 0.0274$) and lower levels of oleic acid ($P = 0.0119$) were detected in meat from animals fed diets without CG. Lower level of linoleic acid ($P = 0.0442$) was observed in meat from animals fed lower CL. Animals fed diets without CG had the highest level ($P = 0.0246$) of linoleic acid, lower CLA (18:2 *cis*-9, *trans*-11) content ($P = 0.0001$) and lower values of monounsaturated fatty acids ($P = 0.0022$) compared with meat from animals fed CG. Animals fed high CL had higher linoleic acid content. The inclusion of crude glycerin in beef cattle diets as a substitute of corn or soybean hulls improves the fatty acid profile of meat by increasing the monounsaturated and linoleic acid contents.

Key Words: beef cattle, glycerol, linoleic acid

W312 Lipid oxidation and color of meat and subcutaneous fat from young bulls fed crude glycerin replacing energy sources on concentrate. J. F. Lage*, E. San Vito, R. A. Silva, A. F. Ribeiro, M. Machado, L. M. Delevatti, L. R. Simonetti, E. E. Dallantonia, R. A. Reis, and T. T. Berchielli, *Universidade Estadual Paulista, Jaboticabal, Sao Paulo, Brazil*.

This trial aimed to evaluate the effects of feeding crude glycerin (CG; 80% glycerol) included on 10% of DM diet, replacing corn or soybean hulls in different ratio of concentrate:roughage (60:40 or 40:60) on lipid oxidation (using thiobarbituric acid reactive substances - TBARS) and color of meat and subcutaneous fat (SF) from young bulls. Sixty

young bulls (Nellore), with 374.11 ± 24.77 kg initial BW were randomly assigned to 6 treatments, with 10 replicates. The diets were: 1- without CG plus corn; 2- association of CG and corn, 3- association of CG plus soybean hulls. These 3 diets were combined with 2 concentrate level (CL; 60:40 or 40:60), resulting in 6 diets (isonitrogenous). Animals were slaughtered at 498.35 ± 33.55 kg BW and all carcasses were refrigerated at 0°C for 24 h. Longissimus muscle (LM) section 10 cm thick was removed from the posterior end of the wholesale rib. LM samples and SF were individually vacuum-packaged and held at -20°C for analysis. The color reading was conducted using the CIE $L^*a^*b^*$ system. The experiment was conducted according to a completely randomized design in a 2×3 factorial arrangement: 2 CL \times 3 feeding regimens (FR). Data were analyzed by the GLM procedure of SAS, and the Tukey test used considering 5% probability. Similar values of lightness (L^* ; $P = 0.4090$), redness (a^* ; $P = 0.8282$) and yellowness (b^* ; $P = 0.7200$) were observed for beef from animals fed different CL. Regards to SF, animals fed lower CL had greater values of b^* ($P = 0.0135$) than those fed higher CL whereas no differences were observed for L^* ($P = 0.3416$) and a^* ($P = 0.5075$) did not differ among animals fed different CL. FR did not affect the variables evaluated with regard to meat color L^* ($P = 0.6284$), a^* ($P = 0.7292$), and b^* ($P = 0.4932$). No effects of CL ($P = 0.4464$) and FR ($P = 0.1868$) were observed for levels of TBARS. The level of inclusion of CG (10% DM) in the diets with different energy sources on concentrate was not enough to promote changes in beef color and lipid oxidation. Animals fed diets with greater proportion of roughage have more yellow subcutaneous fat.

Key Words: glycerol, Nellore, TBARS

W313 Effect of supplementation of an extract rich in flavonoids on meat quality in young Friesian bulls. M. M. Campo¹, B. A. Refat², A. R. Serad², J. Crespo³, and J. Balcells^{*2}, ¹Dept. Animal Production and Food Science, University of Zaragoza, Zaragoza, Spain, ²Dept. Animal Production, University of Lleida, Lleida, Spain, ³Interquim, S.A. (Ferrer HealthTech), Barcelona, Spain.

To assess the effect of flavonoids on meat quality acceptability, 32 young Friesian bulls were randomly divided into 4 pens, according to the dose of Bioflavex (Interquim, SA, Spain) supplemented in the concentrate: 0 (CTR), 150 mg/kg (FL1), 300 mg/kg (FL2) or 450 mg/kg (FL3). Bioflavex is a blend of naringine (200 g/kg) and *Citrus aurantium* extract (400 g/kg). The trial lasted 3 wk, with straw ad libitum, until animals reached the target slaughter weight (414.3 ± 10.7 kg). At 36 h postmortem, the loins between the 7th and 10th vertebrae were obtained, vacuum packaged and kept at 4°C . At 5 d post mortem, the longissimus thoracis was excised and 2-cm-thick steaks were sliced and placed either in polystyrene trays overwrapped with oxygen permeable film or packed with modify atmosphere (MAP; 80% O_2 ; 20% CO_2). Samples were displayed under simulated retail conditions at 4°C under light (700 lx) for 12 h a day during 14 d. A panel of 15 consumers was asked daily to assess the aspect of the meat on a 9-point scale (1 = non-desirable; 9 = very desirable) and to express their willingness to purchase and consume the meat. As expected, consumers preferred meat under MAP than under film conditions, due to color preservation. Consumers preferred the meat with FL from the 7th d of blooming ($P < 0.1$) when stored in film, although the scores were already fairly low (being 3.27 the highest for FL3 vs. 2.76 for CTR). In meat stored under MAP, no differences were found between treatments during the first 7 d of display. However, FL3 showed the best acceptability from there onwards, being the only treatment with a score over 5 (5.09) after 8 d of blooming. The percentage of willingness to purchase the meat stored in MAP remained over 50% till the 7th d of display decreasing afterward,

although the rate of decrease was lower in FL3 (40.3% of willingness) than in the other treatments, especially the CTR group (25.0% of willingness). In MAP, the inclusion of Bioflavex at a dose of 450 mg/kg allows to moderately increase the shelf life of meat (from 7 to 8 d), in terms of consumer purchase decision.

Key Words: beef cattle, flavonoid, meat quality

W314 Meat quality traits of young bulls finished in feedlot with sources of fiber and crude glycerin. M. Machado, A. F. Ribeiro*, L. R. Simonetti, E. E. Dallantonia, J. F. Lage, E. A. Oliveira, E. San Vito, R. A. Silva, A. J. Neto, and T. T. Berchielli, *São Paulo State University, Jaboticabal, SP, Brazil.*

The objective of this study was to evaluate the beef quality of young bulls fed crude glycerin, 80% of glycerol, with different sources of fiber. Ten percent of crude glycerin was used in replacement of corn on diet dry matter. Three sources of roughage: corn silage (T1), sugar cane (T2) and sugar cane bagass (T3) were used at the inclusion level on the diet dry matter of 28, 27 and 17%, respectively. Diets were adjusted to contain 15% of NDF from roughage. Thirty Nellore young bulls with 416 ± 24.68 kg initial BW were randomly assigned to 3 treatments, with 10 replicates during 90 d. Animals were slaughtered at average body weight of 550.50kg BW and all carcasses were chilled at 0°C for 24 h. Longissimus muscle (LM) section 10 cm thick was removed from the posterior end of the wholesale rib, individually vacuum-packaged and maintained under refrigeration at 0°C for 14 d post mortem. The color reading was conducted on the surface, using the CIE L*a*b* system. The water holding capacity (WHC) was measured for the difference between the weights of the sample before and after it was subjected to a pressure of 10 kg for 5 min. Data were analyzed by the GLM procedure of SAS, and the Tukey test used considering 5% probability. The diets did not affect the pH ($P = 0.1951$), WHC ($P = 0.7534$), Warner-Bratzler shear force ($P = 0.2778$) and cooking losses ($P = 0.2528$). Similar values of lightness (L*; $P = 0.2014$), redness (a*; $P = 0.1411$) and yellowness (b*; $P = 0.1506$) were observed on beef. Animals fed with crude glycerin (10% DM) in diets with different sources of fiber showed similar beef quality traits.

Key Words: glycerol, pH, tenderness

W315 Predicting percent empty body fat in calf-fed Holstein steers using carcass measurements. J. E. Hergenreder*¹, M. J. Anderson¹, L. D. Luque², P. D. Bass³, W. Nichols⁵, R. J. Delmore², J. L. Beckett⁴, and B. J. Johnson¹, ¹*Animal and Food Science Department, Texas Tech University, Lubbock*, ²*Animal Science Department, California Polytechnic State University, San Luis Obispo*, ³*Certified Angus Beef, Wooster, OH*, ⁴*Beckett Consulting Services, Fallbrook, CA*, ⁵*Merck Animal Health, Summit, NJ.*

Current empty body fat (EBF) prediction equations using carcass measurements are not as accurate for calf-fed Holstein steers as compared with beef-type cattle. Our objective was to evaluate potential new methods to predict EBF of calf-fed Holstein steers using carcass measurements. Steers ($n = 120$; 127 ± 3 kg) were randomly assigned to a non-implanted control or implanted treatment (Syn C at d 0, Rev IS at d 120, and Rev S at d 240), fed a finishing ration for up to 420 d, and weighed at 30 d intervals. Steers ($n = 8$ to 12) from each treatment were harvested on d 0, 60, 120, 180, 240, 270, 300, 360, and 420. A 9 - 11 rib section was taken from the right side of each carcass to evaluate chemical carcass composition. The 9 - 11 rib section was dissected into eye, lean, and fat portions which were subsequently ground through 4-mm grinder. Chemical analysis was performed to determine EBF using the equation developed by Hankins and Howe (1946), which correlates EBF to the 9 - 11 rib section composition. The equation for predicting EBF in calf-fed Holsteins was developed by regressing carcass factors against the EBF predicted from Hankins and Howe's equation. Percent empty body fat was also calculated with the equation developed Guiroy et al. (2001) for beef-type cattle using carcass measurements, to see how the new equation and Guiroy's equation correlated to Hankins and Howe's equation. The new equation was more highly correlated to Hankins and Howe EBF than Guiroy's equation ($r^2 = 0.83$ and 0.27 , respectively). The new equation was then validated against another population of calf-fed Holstein steers. The new equation was still more highly correlated to Hankins and Howe than Guiroy's equation ($r^2 = 0.43$ and 0.31 , respectively). The newly developed equation is more accurate and correlated to Hankins and Howe's equation in predicting the empty body fat of calf-fed Holstein steers using typical carcass measurements.

Key Words: Holstein steer, implant, empty body fat