during meals is low. Hypophagic effects of fatty acid oxidation in the liver are likely from delaying hunger rather than promoting satiety because beta-oxidation is inhibited during meals by rapid uptake of propionate. A shortage of glucose precursors and increased fatty acid oxidation in the liver for early lactation cows leads to an abundance of NADH and a lack of TCA cycle intermediates, resulting in a buildup of the intracellular acetyl-CoA pool and export of ketone bodies. In this situation, hypophagic effects of propionate may be enhanced, because propionate entry into the liver provides TCA cycle intermediates that allow oxidation of acetyl-CoA. Oxidizing the pool of acetyl-CoA rather than exporting it dramatically increases ATP production and causes satiety, despite the use of propionate for glucose synthesis. A better understanding of metabolic regulation of food intake will allow diets to be formulated to increase the health and productivity of ruminants.

Key Words: Hepatic oxidation, Satiety, ATP

108 Effect of body composition on feed intake and macronutrient selection in growing pigs. M. J. Azain*, *University of Georgia*, *Athens*.

Numerous factors are involved in the regulation of feed intake in growing animals. The focus of this presentation is on the roles that body composition or composition of gain play in energy and amino acid requirements in nonruminants. When fed a single diet, energy is the primary determinant of intake. However, when animals are allowed to select between diets that vary in macronutrient nutrient content, they are able to self-select a diet that optimizes growth. This has been observed with diets that vary not only in crude protein, but in individual essential amino acids. Examples of this ability include studies that examine differences in selection patterns in response to 1) age-associated, 2) repartitioning agent induced or 3) genetic changes in composition of gain. In the case of repartitioning agents, growing pigs treated with somatotropin have changes in the rates of protein and lipid accretion that alter the energy and protein (amino acid) requirements and ultimately affect selection patterns and total feed intake. Similarly, the selection pattern between high and low protein diets differs in pigs with different levels of fatness. The mechanisms involved in the ability to monitor lipid and protein accretion rates in the periphery and to distinguish subtle differences between diets are not clear, particularly in livestock. Research in rodent models suggests that protein accretion likely affects circulating amino acid levels which in turn alter neurotransmitters that are monitored centrally. Leptin or other factors from adipose tissue may be the signal used to monitor rates of lipid accretion. The ability to distinguish differences in incoming nutrients, particularly amino acids is likely through the liver. A better understanding of the mechanisms that tie composition of gain to diet selection would contribute to design of feeding systems that meet the nutrient requirements of individual animals under group housing conditions.

Key Words: Feed intake regulation, Composition of gain, Macronutrients

Ruminant Nutrition: Growing/Finishing Nutrition – Beef

109 Performance evaluation of calf- and yearling-finishing. W. A. Griffin*, T. J. Klopfenstein, G. E. Erickson, D. M. Feuz, and J. C. MacDonald, *University of Nebraska*, *Lincoln*.

The objective of this study was to compare performance of calf (calf-fed) and yearling finishing systems conducted in Nebraska from 1995-2003. Calves were born in April and weaned in October. During the receiving procedure cattle were sorted by weight into two groups. Heavy calves were placed directly into the feedlot and fed an average of 168 d, while lighter calves were placed into a long yearling system. The yearling system consisted of a corn residue grazing period (supplemented wet corn gluten feed (WCGF) at 2.27 kg/hd/d) followed by a summer grazing period. Following summer grazing, yearlings were placed in the feedlot and fed an average of 90 d. Trials included in the data set were selected based on finishing diet composition. Calf-feds were fed a basal diet of either dry-rolled (DRC) or high-moisture corn (HMC) with WCGF (targeted inclusion of 25-40% of the diet). The yearling finishing diet consisted of either DRC or HMC fed with WCGF at an inclusion level of 35-45%. At receiving, calf-feds were heavier than cattle entering the yearling system (292 kg vs. 239 kg; $P < 0.01$) by design. However, when comparing BW at the beginning of the finishing period, yearling cattle were 143 kg heavier than calf-feds ($P < 0.01$). Yearlings had greater ($P < 0.01$) DMI than calf-feds (13.89 kg/d vs. 9.71 kg/d); however, due to the difference in days fed, yearling cattle consumed less DM over the entire finishing period (1252 kg vs. 1633 kg; $P < 0.01$). Daily gain was 0.33 kg higher during the finishing period for yearling cattle ($P < 0.01$); however, calf-feds were 16.7% more efficient ($P < 0.01$) than yearlings (5.63 vs. 6.76). Final BW was 37.7 kg heavier ($P < 0.01$) for yearlings relative to calf-feds, due to a 23.6 kg ($P < 0.01$) heavier HCW. Marbling score was not affected by production system ($P > 0.10$); however, calf-feds had 0.15 cm greater fat thickness. Overall, yearling cattle had fewer days on feed, gained more rapidly, consumed less total DM, and were heavier at slaughter than calf-feds, while calf-feds were more efficient relative to yearling cattle.

Key Words: Calf, System, Yearling

110 Effect of phase feeding protein on cattle performance and nitrogen mass balance in the summer. S. Quinn*, G. Erickson, T. Klopfenstein, R. Stowell, and K. Vander-Pol, *University of Nebraska*, *Lincoln*.

A summer feedlot trial was conducted using 96 yearling steers (374 ± 0.12 kg) to compare conventional CP levels to phase-fed diets balanced for degradable intake protein (DIP) and undegradable intake protein (UIP) on performance and N volatilization. Steers were stratified by BW and assigned randomly to 12 pens and one of two treatments. Treatments were 1) control diet formulated for 14% CP (CON) or 2) a phase-fed diet using the NRC model to balance DIP and UIP requirements over the finishing period and encourage N recycling over the feeding period (PHASE; CP = 14 to 11%). Diets consisted of 83% dry rolled corn, 7% alfalfa hay, 5% molasses and 5% supplement. Nitrogen excretion was determined by the difference between N intake and individual steer N retention. Total N lost was calculated by subtracting manure and runoff N from excreted N. Ammonia emissions were measured weekly during the last six weeks of the feeding period using forced air wind tunnels and a sulfuric acid trap for 30 minutes in each pen. DMI for PHASE was greater ($P = 0.08$) than CON with 10.5 and 10 kg/hd for CON and PHASE, respectively. There was no difference ($P = 0.38$) in ADG between CON and PHASE (1.71

and 1.70 kg, respectively). Steers fed PHASE had similar (P = 0.18) G:F than CON steers (0.170 and 0.163, respectively). There were no significant carcass differences between CON and PHASE. As designed, cattle fed PHASE consumed less (P < 0.01) N and excreted less (P < 0.01) N than steers fed CON with N excretion of 24.9 and 19.3 kg/steer for CON and PHASE, respectively. The amount of manure N was similar (P = 0.35) and runoff losses were similar (P = 0.81) between PHASE and CON. Nitrogen volatilization was lower (P = 0.02) for PHASE fed steers compared to CON with 12.85 and 17.55 kg of N excreted lost for PHASE and CON, respectively. Ammonia emissions were not different (P = 0.95) between the CON and PHASE pens (19.41 and 19.84 g/hd/d) as measured by forced air wind tunnel. Phase feeding gave similar performance and reduced N volatilization without impacting N removed in manure.

Key Words: Cattle, Mass balance, Phase feeding

111 Withdrawn by author.

112 Withdrawn by author.

113 Evaluation of cotton gin trash as a low-cost feedstuff for growing cattle. J. B. Kennedy* and D. L. Rankins, Jr., *Auburn University*, *Auburn, AL*.

Two trials were conducted to evaluate the feeding value of cotton gin trash for beef cattle. In trial 1, 40 Angus x Continental steers were allotted randomly to one of the following 4 diets: 1) 45% peanut hulls + 55% cracked corn, 2) 45% peanut hulls + 47% cracked corn + 8% cottonseed meal, 3) 45% gin trash + 55% cracked corn, and 4) 45% gin trash + 47% cracked corn + 8% cottonseed meal. Each pen contained 5 steers with 2 pens/diet. All diets were fed ad libitum and bermudagrass hay was offered free choice in each pen. Steers were weighed initially and every 28 d throughout the 112-day trial. Data were analyzed as a 2 x 2 factorial, with factors being 2 roughage sources with or without cottonseed meal. Steers fed gin trash gained faster than those fed peanut hulls (P < 0.02; 1.19 vs 0.94 kg/d) and had greater DMI (P < 0.01; 10.3 vs 7.6 kg/d). Diets containing cottonseed meal produced faster ADG (P < 0.02) than those containing no cottonseed meal (1.14 vs 0.99 kg/d) and greater DMI (P < 0.01; 9.7 vs 8.3 kg/d). Hay intake was not different among diets. In trial 2, 16 steers were assigned randomly to one of the 4 diets used in trial 1 (4 steers/diet). Steers were fed their assigned diet for 14 d and then placed in individual metabolism stalls for 8 d of collection. Dry matter intake did not differ among diets and averaged 6.0 kg/d or 2.0% of BW. Fiber digestibility (NDF or ADF) was not different among diets. A significant cottonseed meal by roughage source interaction was detected for DM, OM and CP digestibilities. Dry matter and OM digestibility was greater for diet 3 compared to the other three diets (P < 0.07) Digestibilities for the 4 diets were as follows: 73, 73, 80 and 69% for DM, respectively and 73, 72, 80 and 72% for OM, respectively. Crude protein digestibility was lowest (P < 0.07) for diet 1 (60%) and highest for diet 2 (70%) with diets 3 and 4 being intermediate (66% and 63%). Cotton gin trash was more digestible and resulted in faster ADG than peanut hulls when fed to growing cattle. Protein supplementation increased intake of the gin trash and resulted in better cattle performance.

Key Words: Gin trash, Beef cattle, By-products

114 Digestibility of cottonseed and Tifton 85 hay fed to growing beef steers. G. M. Hill*, B. C. Hand, and B. G. Mullinix, Jr., *University of Georgia*, *Tifton*.

Whole cottonseed (CS) often forms integral parts of dairy and beef cow diets, but less research has focused on younger growing cattle fed CS. Steers (n=28; 334.2 ± 15.4 kg initial BW) were blocked by BW class, and randomly assigned to four treatments (7 steers each), and individually-fed diets for 21 d. Tifton 85 bermudagrass hay (11.9% CP, 37.0% ADF, 77.8% NDF) and minerals were fed free-choice. Dietary treatments included hay with Control supplement [C; 90% ground corn, 10% cottonseed meal (13.7% CP, 12.1% NDF), fed at 2.0 kg/steer daily], or CS (26.1% CP, 37.3% ADF,52.2 % NDF, 17.4% crude fat) as-fed at three levels (LowCS=1.5 kg/d; MedCS=2.5 kg/d; HighCS=3.5 kg/d; or DM at 1.34, 2.23, 3.12 kg/d, respectively). Chromic oxide (10 g/steer daily; d 12 to d 21) was fed as an indigestible marker, mixed with C supplement, or fed in a corn carrier (corn=0.25 kg/steer daily) for CS treatments. Fecal samples (11/steer, d17 to d 21) were analyzed to determine apparent digestion of major dietary nutrients. Hay DMI (Table) was similar for C and LowCS, but significantly lower for MedCS and HighCS. Total DMI and OM digestibility had similar response patterns, including similar Total DMI and OM digestion for C and HighCS, with higher values for these treatments than for LowCS and MedCS. Dietary CP (12.4, 15.0, 16.8, 18.6 % in DM, respectively, for C, LowCS, MedCS and HighCS) and CP digestion increased with dietary level of CS. Dietary ADF and NDF increased with CS additions, but digestibility of ADF and NDF was similar for all diets. Growing steers had depressed dietary DMI and OM digestibility with low and medium levels of CS intake on hay-based diets, but dietary DMI and OM digestibility may not be affected when CS is more than 50% of the diet DM.

Table 1.

Item	Control	LowCS	MedCS	HighCS	SE	*P* <
Hay DMI, kg	4.50	4.25	3.36	3.05	0.13	0.01
Total diet DMI, kg	6.27	5.78	5.57	6.19	0.14	0.01
DM digestion, %	67.36	64.00	63.80	66.78	0.85	0.02
OM digestion, %	68.86	65.84	66.07	68.82	0.89	0.05
CP digestion, %	61.06	66.03	70.93	75.49	0.74	0.01
ADF digestion, %	54.08	56.53	52.04	54.66	1.55	0.26
NDF digestion, %	66.34	64.94	62.25	64.4	1.15	0.15

Key Words: Steer, Cottonseed, Digestion

115 Assessment of energy enhanced roughage (EER) based diets for growing/finishing cattle. J. R. Carpenter*[1] and B. Sporleder[2], [1]*University of Hawaii at Manoa*, *Honolulu*, [2]*Byproducts Enhancement Technologies Corporation (BETC)*, *Fort Collins, CO*.

Forages and energy feeds are key components in the diets of growing and finishing cattle. Both escalating feed costs and ecological considerations prompt investigations into the use of agricultural by-products and processed tropical forages (Energy Enhanced Roughage) in beef production systems. The objectives of this trial were to determine: 1) the variation in nutrient composition and in situ DM, protein and fiber digestibility of fresh Guinea grass (*Panicum maximum*) and processed EER diets, and 2) the production potential of EER in beef rations. Wrapped silage bales were transported to the processing facility, ground, and pretreated with one of two liquors. Treated grass was then cooked in an autoclave and air dried. The EER was then mixed

with a combination of vegetable oil (6% of DM), vitamin, mineral, and protein supplement (0.454 kg/hd/d), and molasses (20% of DM) to create the diet fed once daily. Cattle "(n = 24)" were obtained from three cooperating producers and were randomly assigned by BW and sex to one of 3 treatments (corn and alfalfa based control, and 2 different EER treatments). Each treatment consisted of 2 pens with 3 steers and 3 heifers each. Average BW of the steers and heifers were 295kg and 363kg, respectively. Feed and orts were recorded, animals were weighed by-weekly, and ADG and DM consumption calculated. Two *In situ* trials with 3 fistulated steers were conducted to test both EER mixed rations and individual raw and ensiled Guinea grass for digestibility. Dry matter digestibility of grass increased from 35% up to 85% after processing. Rates and extent of DM disappearance (%/hr) were similar to high energy feedstuffs [4.18% for DM, 4.55% for CP, 4.72% for NDF, and 4.65% for ADF]. During *in situ* runs, pH readings were taken at 1 hr intervals for the first 6 hours after feeding. The pH peaked at 0 h (6.81) and steadily declined to time 3 h (6.22), then the pH slowly increased till time 6 h (6.39). The results showed that the corn fed cattle had better rates of gain, DM consumption and feed conversion than the EER cattle ($p<0.05$).

Key Words: Enhanced energy roughage (EER), *In situ* digestibility, Guinea grass (*Panicum Maximum*)

116 Evaluation of feed efficiency traits in growing Brahman heifers and relationship with body composition ultrasound traits and feeding behavior. F. R. B. Ribeiro*[1], G. E. Carstens[1], P. A. Lancaster[1], L. O. Tedeschi[1], and M. H. M. R. Fernandes[2], [1]*Texas A&M University*, *College Station*, [2]*Universidade Estadual Paulista-FCAV*, *Jaboticabal, SP, Brazil*.

Objectives of this study were to characterize feed efficiency traits and examine phenotypic correlations with performance, body composition ultrasound, and feeding behavior traits in growing Brahman heifers. Individual DMI were measured in Brahman heifers (n = 70; mean (± SD) initial age 318 ± 25 d) fed a corn-silage based diet (ME = 2.78 Mcal/kg). Body weight were measured at 14-d intervals and daily DMI and feeding behavior traits recorded for 63 d using a GrowSafe™ feeding system. Ultrasound 12 to 13th rib fat thickness (UBF) and longissimus dorsi muscle area (ULMA) were measured on days 0 and 63. Residual feed intake (RFI) was computed as the residuals from the linear regression of DMI on mid-test BW$^{0.75}$ (MBW) and ADG (R^2 = 0.22). Overall mean (± SD) ADG, DMI and RFI were 0.99 ± 0.16, 9.17 ± 1.19, and 0.0 ± 1.05 kg/d, respectively. Residual feed intake was correlated with DMI (0.88), feed conversion ratio (FCR; 0.61) but not ADG or MBW. Heifers with low RFI (< 0.5 SD; n = 18) consumed 24.5% less DMI and had 22% lower FCR than heifers with high RFI (> 0.5 SD; n = 25). Final UBF was not correlated with RFI, but tended (P = 0.09) to be correlated (0.21) with FCR. Initial age and BW were correlated with FCR (0.24 and 0.32), but not with RFI, suggesting that younger and lighter heifers at start of test had lower FCR, but similar RFI. Feeding duration (min/d) was correlated (P < 0.05) with DMI (0.29), and RFI (0.28), but not with FCR. Meal frequency (meals/d) was not correlated with either of the feed efficiency traits. Heifers with low RFI spent less time (P < 0.05) at the feed bunk (160 vs. 177 ± 5 min/d), but had similar meal frequencies compared to high RFI heifers. Results suggest that RFI was less influenced by rate and composition of growth, and initial age and BW of heifers compared to FCR.

Key Words: Heifers, Residual feed intake, Feed conversion ratio

117 Effects of sorting and supplementation of optaflexx on yearling feedlot performance. W. A. Griffin*, T. J. Klopfenstein, G. E. Erickson, K. J. Vander Pol, D. M. Feuz, and M. A. Greenquist, *University of Nebraska*, *Lincoln*.

A 2-yr study utilizing 400 yearling steers (436 ± 30 kg) was conducted to determine the effects of sorting by weight upon entry into the feedlot and feeding 200 mg/steer of Optaflexx (OPT) daily the last 28 d on feedlot performance and carcass characteristics. During the winter, steers grazed corn stalks and were supplemented daily with 2.27 kg/steer of wet corn gluten feed. Steers grazed during summer and were finished from September to January. Upon feedlot entry, steers were allotted into one of four treatments in a 2x2 factorial design: sorted with OPT, sorted without OPT, no sort with OPT, and no sort without OPT. Sorted steers were placed into one of three groups based on initial BW (heavy, medium, and light). Steers were sorted into groups of 32% heavy, 44% medium, and 24% light and were fed accordingly based on sort group, 97, 118, and 132 d, respectively. Initial BW for heavy, medium, and light steers averaged 468, 432, and 399 kg, respectively. Initial BW for unsorted steers averaged 436 kg and were fed 111 d. There were no SORT*OPT interactions (P > 0.10) and feeding OPT had no effect on steer live or carcass performance (P > 0.10). Daily gain, DMI, and feed efficiency were not different comparing sorted steers to unsorted steers (P > 0.10). Sorted steers were fed more days than unsorted steers (114 vs. 111; P < 0.01) and had a numerical increase in final BW of 4.4 kg (P = 0.15) due to a numerical increase in HCW of 2.8 kg (P = 0.14). Sorted steers were not different in USDA Yield Grade (YG), marbling score, and percent choice (P > 0.10) compared to unsorted steers. Sorted steers had a 5.23 cm^2 increase in LM area (P < 0.01), a 0.14 cm increase in 12th rib fat thickness (P = 0.04), and a 7.5 percentage unit increase in USDA YG 4 carcasses (P = 0.02) compared to unsorted steers. However, no difference (P = 0.75) was observed in percent heavy carcasses (> 432 kg) between sorted and unsorted steers. From this study we conclude no benefits to sorting yearling steers or feeding Optaflexx

Key Words: Optaflexx, Sorting, Yearling

118 Evaluation of feeding ractopamine (Optaflexx®) with various levels of dietary crude protein on growth performance in feedlot steers. S. Sachtleben[1], E. Thomas[2], W. Platter[2], and A. Schroeder*[2], [1]*Kent Feeds, Inc.*, *Muscatine, IA*, [2]*Elanco Animal Health*, *Greenfield, IN*.

Ractopamine HCl, (RAC), was recently approved by the US FDA CVM for feeding to cattle during the last 28 to 42 of the finishing period. The effects of feeding 200mg•hd^{-1}•d^{-1} RAC and 10, 12 and 14% CP for the final 34 days of the finishing period was evaluated on growth performance characteristics in feedlot steers. A randomized complete block design was used with pens arranged in a 2x3 factorial design of 4 replicates per treatment. Each pen contained 6 steers. All steers received 260 mg•hd^{-1}•d^{-1} Rumensin and were implanted with Synovex Choice®, 98 d before slaughter. Steers were slaughtered and graded at a commercial facility after a 24 hr chill. No RAC X CP interactions were detected (P>.05) thus least squares means for main effects of RAC are reported. Dietary protein concentration did not affect (P>.05) cattle feedlot performance. Average daily gain (kg) for each respective CP group (10, 12 or 14% CP) was 1.82, 1.98 and 1.98. Steers gained at a faster rate (P=.01) when fed RAC. Dry matter intake was not influenced by RAC treatment (P>.05). Steers fed RAC

converted feed to gain more efficiently (P<.01). Total weight gain of cattle fed 200 mg•hd^{-1}•d^{-1} of Optaflexx for 34 days was 10.07 kg more than control steers (1.7%). Average daily gain was improved by 16.8% with the use RAC. These data demonstrate that RAC when fed with 10, 12 or 14% dietary CP for the last 34 d of the finishing period, improves growth performance in steers.

Table 1. Effect of RAC on Growth Performance in Steers

Item	RAC 0	mg 200	SEM	PRAC Level
Initial wt, kg[a]	505.53	505.08	0.23	0.18
Final wt, kg[a]	566.04	575.66	2.48	0.01
DMI, kg	10.00	10.26	0.14	0.20
Total wt gain, kg	60.51	70.58		
ADG, kg	1.78	2.08	0.07	<0.01
Feed/Gain	5.72	4.98	0.17	<0.01
Gain/Feed	0.177	0.202	0.006	<0.01

[a]4% pencil shrink

Key Words: Beef, Growth performance, Ractopamine

119 Evaluation of feeding ractopamine (Optaflexx®) with various levels of dietary crude protein on carcass characteristics in feedlot steers. S. Sachtleben[1], E. Thomas[2], W. Platter[2], and A. Schroeder*[2], [1]*Kent Feeds, Inc.*, *Muscatine, IA*, [2]*Elanco Animal Health*, *Greenfield, IN*.

Ractopamine HCl, (RAC), was recently approved by the US FDA CVM for feeding to cattle during the last 28 to 42 d of the finishing period. The effects of feeding 200mg•hd^{-1}•d^{-1} RAC and 10, 12 and 14% CP for the final 34 d of the finishing period was evaluated on carcass characteristics in feedlot steers. A randomized complete block design was used with pens arranged in a 2x3 factorial design of 4 replicates per treatment. Each pen contained 6 steers. All steers received 260 mg•hd^{-1}•d^{-1} Rumensin and were implanted with Synovex Choice®, 98 d prior to slaughter. Steers were slaughtered and graded at a commercial facility after a 24 hour chill. Least squares means for main effects of RAC on carcass characteristics are reported. Feeding RAC to steers increased HCW by 5.7 kg (1.63%, P=.01) compared to non-RAC fed cattle. Steers fed diets with 12% or 14% CP tended to exhibit heavier (P=.10) HCW (362.33 and 362.47 kg, respectively) than those fed the 10% CP ration (357.03 kg). Several RACxCP interactions were detected. Feeding RAC to cattle fed low protein (10% CP) diets tended to decrease KPH fat, however, 12% and 14% CP diets had little effect on carcass KHP fat (RACxCP P=.11). The use of RAC (200 mg•hd^{-1}•d^{-1}) in cattle fed low protein (10%) diets suggested that marbling score decreased (630.1 vs 576.0) but increased marbling score in the presence of 12% (575.8 vs 585.8) or 14% (552.1 vs 578.3) rations (RACxCP P=.10). Other carcass traits were unaffected (P>.05) by RAC treatment. These data demonstrate that RAC when fed with 10, 12 or 14% dietary CP for the last 34 d of the finishing period, will increase HCW without other detrimental effects on carcass characteristics in steers.

Table 1. Effect of RAC on Carcass Characteristics in Steers

Item	RAC 0	mg 200	SEM	PRAC Level
Final wt, kg[a]	566.04	575.66	2.48	0.01
HCW, kg	357.80	363.60	1.49	0.01
Dress Percent, %	63.2	63.2	0.22	0.87
REA, cm^2	86.90	86.13	0.023	0.58
12th rib fat, cm	0.173	0.169	0.009	0.66
KPH, %	2.10	2.03	0.07	0.52
YG	2.72	2.76	0.09	0.75
Overall maturity[b]	157.8	157.5	0.89	0.79
Marbling score[c]	586.0	580.0	11.48	0.72
Conformation score	20.2	20.3	0.08	0.27

[a]4% pencil shrink [b]100=A0 [c]500=small 0

Key Words: Beef, Carcass, Ractopamine

120 The effects of dose and duration of ractopamine-HCl administration on finishing performance and carcass traits of non-implanted beef heifers. M. J. Quinn*, J. S. Drouillard, C. D. Reinhardt, A. S. Webb, J. M. Pozuelo, M. L. May, C. E. Walker, and S. J. Winterholler, *Kansas State University*, *Manhattan*.

Effects of dose and duration of ractopamine-HCl (RAC) administration were examined in non-implanted beef heifers (n=282, 451±4 kg). A control diet (CON; no ractopamine) was compared to diets providing 200 mg RAC per animal daily for periods of 28 or 42 d (200x28 and 200x42, respectively); 300 mg/d for 28 d (300x28); and a step-up regimen consisting of 14 d at 100 mg, followed by 14 d at 200 mg, and the final 14 d at 300 mg (Step-up). Heifers were fed diets of 83% steam-flaked corn, 7% alfalfa hay, 5% corn steep liquor, and 5% supplement. Diets contained 13% CP, and provided 90 mg tylosin and 300 mg monensin per animal daily. For calculation of carcass gain and gain efficiency, initial (42 d before harvest) and final (at harvest) dressed yields were assumed to be 62% and 64%, respectively, for all treatments. Performance measurements that appear in the table below reflect averages for the final 42 d on feed. Feeding RAC increased carcass gain and carcass gain efficiency compared to CON for 200x42 and Step-up. Administration of RAC had no effect on marbling score, yield grade, LMA, KPH, or percentages of carcasses grading USDA Choice (P>0.10). Feeding ractopamine-HCl to non-implanted finishing heifers generally yielded modest improvements in carcass gain and gain efficiency with minimal impact on carcass characteristics. These effects were most pronounced in heifers fed ractopamine for 42 d.

Table 1. Finishing performance and carcass traits of non-implanted heifers fed ractopamine-HCl

Item	CON	200x28	300x28	200x42	Step-up	SEM
Carcass gain, Kg/d	0.58^{a}	0.67^{ab}	0.68^{ab}	0.77^{b}	0.75^{b}	0.13
DMI, Kg/d	8.2^{a}	8.2^{a}	7.7^{b}	8.2^{a}	7.9^{a}	0.27
Carcass efficiency	0.071^{a}	0.083^{ab}	0.089^{ab}	0.095^{b}	0.096^{b}	0.008
Marbling score	4.38	4.31	4.11	4.27	4.08	1.34
Yield grade	2.09	2.12	2.23	2.31	2.36	0.10
% USDA Choice	60.7	70.7	55.3	61.8	59.3	7.23

Means with different superscripts differ (P<0.05). Marbling scores are slight=3.00 to 3.99, small=4.00 to 4.99, and modest=5.00 to 5.99.

Key Words: Ractopamine-HCl, Heifers, Cattle