452 Relationships between residual feed intake, ultrasound, and temperament traits in Brangus heifers, P. A. Lancaster1, G. E. Carstens1, E. G. Brown1, R. D. Randle1, T. H. Welsh, Jr., T. D. A. Forbes1, D. T. Dean1, and A. D. Herring1

Texas Agricultural Experiment Station, College Station, and Agricultural Experiment Station, Overton, Texas Agricultural Experiment Station, Uvalde.

Residual feed intake (RFI) is a moderately heritable feed efficiency trait that is independent of changes in ADG and BW. Objectives of this study were to measure RFI in growing heifers and examine phenotypic correlations between RFI and performance, body composition, and escape velocity (indicator of temperament). Purebred embryo-transfer Brangus heifers (Camp Cooley Ranch; n = 114) were individually fed a roughage-based diet (ME = 2.2 Mcal/kg) using Calan-gate feeders. Weekly BW and DMI were measured for 70 d, and RFI calculated as the residual value from linear regression of DMI on mid-test BW and ADG. Ultrasound measures of 12th rib fat thickness (BF), longissimus muscle area (REA), and percent intramuscular fat (IM), and escape velocity were measured on d 0 and 70. Overall, ADG, DMI, and RFI were 0.90 (SD = 15), 9.10 (SD = 1.11), and 0.0 (SD = .75) kg/d, respectively. Escape velocity on d 70 was correlated with ADG (r = -0.28; P < 0.01) and DMI (r = -0.22; P < 0.05), but not with RFI. Escape velocity on d 70 was also correlated with BF on d 70 (r = -0.25; P < 0.01) and gain in BF (r = -0.21; P < 0.05). Results suggest that heifers with calmer temperaments had improved DMI and ADG but not RFI. RFI was correlated (P < 0.01) with DMI (r = 0.68) and feed conversion ratio (FCR; r = 0.56), but not with ADG initial or final BW. FCR was correlated with ADG (r = -0.69; P < 0.01) and DMI (r = 0.18; P = 0.05). Average RFI for heifers with low (< 0.5 SD below the mean; n = 36) and high (> 0.5 SD above the mean; n = 31) RFI was -0.79 and 0.97 ± 0.6 kg/d, respectively. Heifers with low RFI consumed 18% less (P < 0.01) DMI and had 16% lower (P < 0.01) FCR than high RFI heifers, even though final BW and ADG were similar for both groups. RFI was not correlated with REA, BF, or IM measured on d 70, but tended to be correlated with gain in BF (r = 0.17; P = 0.08) and gain in IM (r = -0.17; P = 0.07) from d 0 to 70 of the trial. Increased leanness may have contributed to the enhanced feed utilization of low RFI heifers, but the magnitude of this contribution was small.

Key Words: Net Feed Efficiency, Escape Velocity, Carcass Traits

453 Relationships between feed efficiency and real-time ultrasound traits in growing and finishing steers, E. G. Brown1, G. E. Carstens1, J. T. Fost1, S. A. Woods1, D. T. Dean1, A. D. Herring1, S. Moore1, and P. C. Geho1

Texas Agricultural Experiment Station, College Station, and King Ranch, Kingsville, TX.

The objective of this study was to examine phenotypic correlations between three feed efficiency traits and ultrasound measurements of 12" rib fat thickness (BF), longissimus muscle area (REA), and percent intramuscular fat (IM), and escape velocity were measured on d 0 and 70. Overall, ADG, DMI, and RFI were 0.90 (SD = 15), 9.10 (SD = 1.11), and 0.0 (SD = .75) kg/d, respectively. Escape velocity on d 70 was correlated with ADG (r = -0.28; P < 0.01) and DMI (r = -0.22; P < 0.05), but not with RFI. Escape velocity on d 70 was also correlated with BF on d 70 (r = -0.25; P < 0.01) and gain in BF (r = -0.21; P < 0.05). Results suggest that heifers with calmer temperaments had improved DMI and ADG but not RFI. RFI was correlated (P < 0.01) with DMI (r = 0.68) and feed conversion ratio (FCR; r = 0.56), but not with ADG initial or final BW. FCR was correlated with ADG (r = -0.69; P < 0.01) and DMI (r = 0.18; P = 0.05). Average RFI for heifers with low (< 0.5 SD below the mean; n = 36) and high (> 0.5 SD above the mean; n = 31) RFI was -0.79 and 0.97 ± 0.6 kg/d, respectively. Heifers with low RFI consumed 18% less (P < 0.01) DMI and had 16% lower (P < 0.01) FCR than high RFI heifers, even though final BW and ADG were similar for both groups. RFI was not correlated with REA, BF, or IM measured on d 70, but tended to be correlated with gain in BF (r = 0.17; P = 0.08) and gain in IM (r = -0.17; P = 0.07) from d 0 to 70 of the trial. Increased leanness may have contributed to the enhanced feed utilization of low RFI heifers, but the magnitude of this contribution was small.

Key Words: Net Feed Efficiency, Escape Velocity, Carcass Traits

454 Optimizing use of distiller’s grains in finishing cattle diets. B. E. Depenbusch1, J. S. Drouillard, E. R. Loe1, and M. E. Cortigan, Kansas State University, Manhattan.

Two hundred ninety-nine crossbred-yearling steers (363 ± 15 kg initial BW) were fed for 114 days in a finishing study comparing 7 diets in which steam-flaked corn was used as the principal energy source. A control diet (CONTROL) without distiller’s grains was compared to six diets in which a portion of the flaked corn was replaced with distiller’s grains with solubles (approximately 15% of DM). These diets contained wet sorghum distiller’s grains with 0 or 6% alfalfa hay (WSDG0H, WSDG6H); dry sorghum distiller’s grains with 0 or 6% alfalfa hay (DSDG0H, DSDG6H); and wet or dry corn distiller’s grains with alfalfa hay (WCDG6H and DCDG6H, respectively). Average daily gains were 1.44, 1.35, 1.37, 1.22, 1.41, 1.45 kg/d; DMI were 9.34, 8.71, 9.39, 8.66, 9.57, 9.21, 9.48 kg/d; and feed efficiencies were 0.154, 0.155, 0.147, 0.142, 0.148, 0.153, 0.153 for steers fed CONTROL, WSDG0H, WSDG6H, DSDG0H, DSDG6H, WCDG6H and DCDG6H, respectively. Steers fed sorghum-based distiller’s diets with hay consumed more feed (P < 0.01) and gained more weight (P < 0.01) than steers fed diets without hay, but gain efficiencies were not different (P > 0.76). Dry matter intake and ADG were similar for steers fed wet and dry sorghum-based distiller’s grains (P > 0.30), but steers fed wet sorghum distiller’s grains tended (P = 0.08) to be more efficient than those fed dry sorghum distiller’s grains. Steers fed corn- and sorghum-based distiller’s grains had similar (P > 0.12) DMI, ADG, and efficiencies. Carcass attributes were largely uninfluenced by diet. These data suggest that distiller’s grains with solubles derived from sorghum and corn are comparable when added to feedlot diets. Furthermore, complete removal of hay from the diet is not advised on the basis of these data.

Key Words: Distiller’s Grains with Solubles, Roughage, Steam-Flaked Corn

455 Effects of vegetable and animal lipid sources on meat sensory attributes and longissimus muscle fatty acid profile from yearling beef steers. E. R. Loe1, J. S. Drouillard1, K. A. Hachmeister2, and F. N. Owens2, Kansas State University, Manhattan, 1Pioneer Hi-Bred International, Des Moines, IA.

From 363 harvested steers, 108 carcasses were selected based on visual appraisal of phenotype and fat thickness for analysis of meat sensory attributes and fatty acid profiling of fat from the longissimus muscle. Finishing diets had been fed for 132 d: 1) control - no added lipid, 2) tallow, 3) dry-rolled soybeans, 4) high-linoleic sunflowers, 5) mid-oleic sunflowers, and 6) high-oleic sunflowers. Rib sections were removed from one side of each carcass (2 carcasses/pen; 9 pens/treatment) approximately 24 h postmortem. Ribs were de-boned, packaged in impermeable vacuum bags, and stored at 0°C. After 14 d of storage, rib sections were removed from the vacuum packages and cut into steaks 2.5 cm thick for sensory analysis by trained panelists. Pen was the experimental unit and data were analyzed using SAS Proc Mixed, testing for linear and quadratic effects of oleic acid within sunflower treatments. Intensity of beef flavor was greater for cattle fed no added lipid than for cattle fed added lipid (P < 0.01). Off-flavor intensity was greater for steers receiving supplemental lipid (P < 0.05). Myo-inositol and steak tenderness were greater for steaks from cattle.


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fed mid-oleic vs high-linoleic or high-oleic sunflowers (quadratic; \( P < 0.05 \)). Intensity of beef flavor and off-flavor intensity responded quadratically (\( P < 0.001 \)) to dietary oleic acid; steaks from cattle fed mid-oleic sunflowers had greater intensity of beef flavor and lower intensity of off-flavor than steaks from cattle fed high-linoleic or high-oleic sunflowers. Steaks from cattle fed soybeans had more C18:2 fatty acids than steaks from steers fed sunflowers. Oleic acid content of steaks increased and linoleic acid decreased (linear; \( P < 0.001 \)) as oleic acid content of sunflowers was increased. Dietary lipid source and fatty acid profile of lipid sources can influence flavor intensity and fatty acid profile of beef.

**Key Words:** Vegetable Oil, Tallow, Fatty Acid

456 **Effects of source of lipid on finishing cattle performance and carcass characteristics.** E. R. Loec, J. D. Drouillard, and F. N. Owens, Kansas State University, Manhattan, Pioneer Hi-Bred International, Inc., Des Moines, IA.

Crossbred steers (\( n = 376; 340 \pm 21 \) kg) were fed for 132 d to evaluate effects of lipid source on feedlot performance and carcass merit. Steers were blocked by BW and allotted randomly to diet (9 pens/diet). Diets included 1) control - no added fat; 2) tallow; 3) dry-rolled soybean; 4) whole high-oleic sunflower seed; 5) whole mid-oleic (66.7% of oil) sunflower seed; 6) whole high-oleic (86.8% of oil) sunflower seed; dietary fat concentrations were 3.2, 6.6, 6.5, 6.8, 7.1, and 6.0% (DM basis), respectively. Diets contained steam-flaked corn (mean = 72%) and 6.3% ground alfalfa hay (DM basis), and were formulated to contain 14% CP, 0.8% Ca, 0.75% K, and to provide 300 mg monensin and 90 mg tylolcin, and 0.5 mg melengestrol acetate per heifer daily. DMI were not different among treatments (\( P > 0.21 \)). There was an interaction between ractopamine and protein source for live weight gain and gain efficiency (\( P < 0.05 \)).

**Key Words:** Ractopamine, Heifers, Protein


Crossbred heifers (\( n=72; 475 \pm 6 \) kg initial BW) were used in a 28-d finishing study with a 2 \( \times \) 3 factorial arrangement of treatments. Factors consisted of protein source (with increasing UIP concentrations) and level of ractopamine-HCI (0 or 200 mg/heifer daily). Heifers were implanted with Revalor-H 60 d prior to starting the study. After allotment to treatments (12 heifers/treatment), heifers were placed into individual feeding pens (10 m²). Flaked corn finishing diets were formulated to 14% CP (dry basis) using 1.5% urea (UREA); 0.5% urea + 6.6% solvent extracted soybean meal (SBM); or 0.5% urea + 7.9% expeller process soybean meal (EXSBM), and provided 300 mg monensin, 90 mg tylolcin, and 0.5 mg melengestrol acetate per heifer daily. DMI were not different among treatments (\( P > 0.21 \)). There was a significant interaction between ractopamine and protein source for live weight gain and gain efficiency (\( P < 0.05 \)).

**Key Words:** Ractopamine, Feedlot, Steers

Breeding and Genetics: Beef Cattle Breeding and Genetics

459 **Educating beef cattle breeders on the use of genomic technology for quantitative traits.** W. Shafer*, American Simmental Association, Bozeman, MT.

Individuals with little or no technical expertise make the majority of beef cattle breeding decisions. Even so, due to an extensive educational effort and the technology's effectiveness, the decidedly technical EPD has become common currency in beef cattle breeding—evolving into the primary tool for affecting additive change in a population. Traditional EPDs have shortcomings, however. Specifically, Mendelian sampling relegates non-parents to low-accuracy evaluation and some economically important traits are not suited to the large-