were greater during infusion in GnRH-infused sows compared to saline-infused sows. Serum FSH decreased in sows infused with GnRH ($P < 0.001$). After GnRH infusion follicular diameter and serum estradiol decreased in GnRH-infused sows and FSH concentrations rebounded above saline control. We conclude that follicular populations before weaning in sows are dependent on GnRH-induced LH release but cannot be sustained in the absence of LH support prior to weaning.

	Estradiol	pg/mL*	FSH	ng/mL*	Diameter	(mm)*
Hour	GnRH	Saline	GnRH	Saline	GnRH	Saline
-96[a]	5.5±4.8	8.7±4.2	13.8±2.4	12.4±2.0	1.8±0.3	2.4±0.3
-48[b]	21.2±4.2	5.6±4.2	10.5±2.4	13.7±2.3	3.5±0.3	2.8±0.3
0[c]	3.1±4.8	7.7±4.8	13.6±2.9	11.0±2.3	4.3±0.3	2.6± 0.4
48	9.7±4.8	10.6±4.8	24.3±2.4	12.5±2.3	2.9±0.3	3.2±0.3
96	7.9±5.9	9.8±4.8	14.9±2.9	8.6±2.3	5.2±0.3	5.2±0.3

*lsmeans ± SEM
[a]start of infusion, [b]end of infusion, [c]day of weaning

Key Words: GnRH, Follicle, Lactating sows

Production, Management, & the Environment

475 Interrelationship between various measurements of temperament in Brahman cows and their Brahman calves.

K. O. Curley*, D. A. Neuendorff, A. W. Lewis, and R. D. Randel, *Texas A&M University Agricultural Experiment Station, Overton, TX.*

Animal temperament has been inversely associated with carcass quality and feedlot performance traits. Temperament can be assessed through both subjective and objective methodologies. The objectives of this study were 1) to compare temperament evaluations of exit velocity from a squeeze chute, chute score, pen score and temperament ratings obtained from longtime knowledge of the dam's reaction to handling; and 2) identify any correlations between calf and dam temperaments. A group of Brahman females (n= 47; 4-13 yrs old) and their spring-born Brahman-sired calves was utilized. Cow temperament rating (T) was identified as (1= calm, 2= normal, and 3= wild). Three other assessments were obtained while working the cattle through a manual squeeze chute at weaning. Chute scores (CS) were determined from behavioral responses to restraint on the scale (1=quiet to 5=wild). Exit velocity (EV) was measured (m/sec) as the animals exited the chute and traversed a fixed distance (1.83m). A set of infrared sensors acted as remote triggers for the start and stop of the timing device. Pen scores (PS) (1=quiet to 5=wild) were ascertained from calf behavior while the animals were in small groups (n<10) after exiting the squeeze chute. Pearson correlation coefficients (r) and ANOVA were utilized for statistical comparisons. Cow T influenced (P<.02) EV (1=.77 ± .02, 2=1.13 ±.13 and 3=1.61 ±.20 m/sec). There was no significant influence of dam T or calf sex on calf EV, CS, or PS. In cows T was correlated with EV r=.45 (P<.01) and with CS r=.39 (P<.01). T was not measured in the calves due to a lack of observations necessary to make this rating. Calf EV was correlated to calf CS r=.47 (p<.01) and PS r=.55 (P<.01). As T, CS, and PS are subjective scores and EV is an objective continuous measurement EV may prove to be a valuable measurement of temperament.

Key Words: Temperament, Chute score, Pen score

476 Interrelationship between various measurements of temperament in Brahman cows and their Hereford-sired calves.

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Animal temperament has been inversely associated with carcass quality and feedlot performance traits. Temperament can be assessed through both subjective and objective methodologies. The objectives of this study were 1) to compare temperament evaluations of exit velocity from a squeeze chute, chute score, pen score and temperament ratings obtained from longtime knowledge of the dam's reaction to handling; and 2) identify any correlations between calf and dam temperaments. A group of Brahman females (n=55; 3-13 yrs old) and their spring-born Hereford-sired calves was utilized. Cow temperament rating (T) was identified as (1=calm, 2=normal, and 3=wild). Three other assessments were obtained while working the cattle through a manual squeeze chute at weaning. Chute scores (CS) were determined from behavioral responses to restraint on the scale (1=quiet to 5=wild). Exit velocity (EV) was measured as the animals exited the chute and traversed a fixed distance (1.83m). Pen scores (PS) (1=quiet to 5=wild) were ascertained from calf behavior while the animals were in small groups (n<10) after exiting the squeeze chute. Pearson correlation coefficients (r) and ANOVA were utilized for statistical comparisons. Cow T influenced (P<.01) cow EV (1=.90.20, 2=1.45 .14, and 3=2.28.18 m/sec) and cow CS (1=1.13.18, 2=1.22.12, and 3=2.06.16). Cow T influenced (P<.05) calf EV (1=1.60.33, 2=1.72.22, and 3=2.65.30 m/sec), calf CS (1=1.53.20, 2=1.64.13, and 3=2.44.18) and calf PS (1=1.86.29, 2=2.29.19, and 3=2.86.26). Cow T was correlated with cow EV r=.61 (P<.01) and cow CS r=.47 (P<.01). T was not measured in the calves due to a lack of observations necessary to make this rating. Cow T was correlated to calf EV r=.33 (P<.02), CS r=.46 (P<.01) and PS r=.33 (P<.02). Calf EV was correlated to calf CS r=.60 (p<.01) and PS r=.78 (P<.01). Cow EV was correlated with calf EV r=.31 (P<.03) and calf CS r=.38 (P<.01). Temperament of a calf can be associated with dam temperament.

Key Words: Temperament, Chute score, Pen score

477 Breed type and gender effects on chute exit velocity and chute temperament score in beef calves.

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Time to travel a short distance after release from a squeeze chute and subjective chute temperament score (1 = calm, quiet - 5 = attempt to escape, highly agitated) have both been correlated with feedlot and meat quality traits. Objectives of this study were: evaluate effects of breed type and gender on exit velocity (EV, m/s) and chute temperament score (CS), and measure relationships between EV and CS two times near weaning. Braford (BO, n = 62), and Brangus (BN, n = 92) calves were weighed on a platform scale and CS was assigned. Calves were then released to a squeeze chute and restrained with head caught. After a blood sample was obtained the calf was released and time recorded to travel 1.83 m. Measurement one (T1) occurred when half of the calves within breed type and gender were weaned. Measurement two (T2) was fifty d later when the remainder were weaned. Least squares means were obtained from PROC MIXED with main effects breed type and gender with weaning group included for T2. Breed type was a significant source of variation in EV and CS but gender and the two-factor interaction were not significant for T1. Braford (1.86 ± 0.10 m/s) were slower than BN (2.23 ± 0.08 m/s). Breed type and gender were significant but weaning time was not significant at T2 for EV. Braford were still slower than BN (1.45 ± 0.10 m/s and 1.92 ± 0.08 m/s, respectively). Heifers were faster than steers (1.91 ± 0.09 and 1.45 ± 0.09 m/s, respectively). The correlation coefficient (r) between the two EVs was 0.54 ($P < 0.01$). The r between EV and CS were 0.29 ($P < 0.01$) for T1 and 0.31 ($P < 0.01$) for T2. In conclusion significant differences exist between breed types for EV and CS. Although the correlation coefficients between velocity and score were significantly different from zero the magnitudes were only moderate in magnitude. The exit velocity may be preferred due to the subjective nature of the score and the limited ability to distinguish subtle differences between animals.

Key Words: Temperament, Beef cattle, Weaning

478 Breed of sire and gender effects on chute exit velocity and chute temperament score in beef calves. R. C. Vann*[1] and R. D. Randel[2], [1]*MAFES/Brown Loam Experiment Station-Raymond,* [2]*Texas Agricultural Experiment Station-Overton.*

The objectives of this study were to evaluate effects of breed of sire, age of dam and gender on exit velocity (EV, m/s), chute temperament score (CS; 1=calm, no movement to 5=jumping and rearing, highly agitated) and pen temperament score (PS; 1=non-aggressive, not excited by humans to 5=aggressive, runs into fences and at humans if approached) and measure relationships between EV, CS and PS at two times near weaning. Crossbred calves (n=195) were assigned a PS, then calves were weighed on a platform scale and CS was assigned. Calves were then released to a squeeze chute and restrained. After a blood sample was obtained the calf was released and time recorded to travel 1.83 m. Measurement one (T1) occurred 21 d after weaning and the second measurement (T2) 90 days later. Least square means were obtained from PROC MIXED with main effects of sire breed, gender and age of dam. Breed of sire (Angus or Brangus) was not a significant source of variation for EV, CS or PS. Gender was a significant source of variation for EV and PS at T1 and was different for EV at T2 ($P < 0.06$). Heifers had a greater EV at T1 and T2 (1.75 ± 0.10 and 2.48 ± 0.14 m/s, respectively) compared to steers (1.56 ± 0.10 and 2.22 ± 0.15 m/s, respectively). The correlation coefficient (r) between EV at T1 and T2 was 0.68 ($P < 0.001$). The r between EV and CS was 0.26 ($P < 0.002$) at T2. The r between EV and PS were 0.489 ($P < 0.001$) at T1 and 0.487 ($P < 0.001$) at T2. In conclusion, breed of sire was not a significant source of variation in chute exit velocity however, differences existed between steers and heifers. Although the correlation coefficients between velocity and temperament score were significantly different from zero the magnitudes were only moderate. In this case, pen score had a better correlation with velocity than chute score. The exit velocity may be preferred due to the subjective nature of the temperament score.

Key Words: Temperament, Beef Cattle, Weaning

479 Effects of ranch management on performance of newly received feedlot calves. S. M. Holt*, R. H. Pritchard, and T. A. Wittig, *South Dakota State University.*

The effect of ranch management on weaning and relocation stress was investigated using spring born steer calves from a single source. Steers on mature dams (age >4y) were not weaned (NW) until shipped. Steers on young dams (<4y) were previously weaned (PW) 1 mo prior to shipment by the cooperating ranch. The steers were reared on native range prior to weaning. At shipment in late October tympanic temperature (TT) loggers were placed in 13 steers from each management group at shipment. All calves were then transported 580km to a feedlot. After resting (36 h) steers were vaccinated, dewormed and weighed individually (weaning weight (WW)). A cracked corn-grass hay diet (1.69 Mcal/kg NEm and 1.03 Mcal/kg NEg) was fed for 21d. WW was similar (P>.10) for PW (266kg) and NW (263kg) groups. Body weight after 21d in the feedlot (291kg vs 293kg) and DMI (6.7kg vs 6.8kg) were similar (P>.10) between PW and NW steers, respectively. Average daily gain (1.21 vs 1.44kg) and gain efficiency (181 vs 212g/kg) were higher (P<.05) in NW steers. Morbidity and mortality were nil for both PW and NW groups. Time series analysis was used to determine TT differences due to management. NW steers recorded higher TT (0.67^0C;P<.05) than PW steers during loading and transportation from the ranch, indicating a greater initial stress associated with NW. After 10h, TT of management groups converged and followed similar diurnal patterns for the remaining 5 d of recording. Diurnal TT patterns begin to mimic those of PW within approximately 1 h of arrival at the feedlot (12h post-weaning), suggesting that recently weaned calves were able to rapidly achieve homeostatic conditions for TT. During the first 4d at the feedlot DMI was lower for NW steers (5.06 vs 2.76kg/d; P<.05) and was slightly below maintenance. There were no differences (P>.05) in TT associated with this period of negative energy balance. Results indicate that pre-transit weaning, as a part of feedlot transition, did not add sufficient stress to alter TT compared to previously weaned calves.

Key Words: Cattle, Tympanic temperature, Stress

480 Thermoregulation and weight change in Hereford and Senepol steers as affected by forage type and estrogen therapy. R. Browning, Jr.*, S. H. Kebe, M. Byars, E. Lane, and C. Johnson, *Tennessee State University, Nashville.*

Hereford (n = 30; H) and Senepol (n = 26; S) 3-yr-old steers were fed endophytic tall fescue (T) or orchardgrass (O) hay and seed for 8 wk during July and August to assess breed, diet, and estrogen effects on thermal and weight status. Half of the steers in each breed-diet group received s.c. estradiol implants (E) and half were not implanted (N). Implant × breed × diet interaction and implant as a main effect did not influence ($p > 0.2$) respiration rates, shade use, or skin temperature. Breed × diet affected ($p = 0.01$) respiration as SO steers (66 ± 4 breaths/min) had lower rates compared to HO, ST, and HT (88, 89, 92 $\pm$ 4 breaths/min, respectively). Breed and diet as main effects affected ($p < 0.05$) shade use and skin temperatures. Shade use was lower for O vs. T steers (47 vs. $60 \pm 3\%$) and lower for S vs. H (20 vs. 87 $\pm$ 3%). Skin temperatures were lower for O vs. T (37.55 vs. $37.77 \pm 0.14^\circ$C) and lower for S vs. H steers (37.07 vs. $38.25 \pm 0.13^\circ$C). Implant × breed × diet affected weight gain ($p = 0.14$) and the percentage of steers gaining weight ($p = 0.03$). Weight was gained by $100 \pm 13\%$ of SOE, SON, HOE, and HON steers (ADG = 946, 572, 413, and 321 ± 156 g/d, respectively), 86% of STN (230 g/d), 68% of STE (269 g/d), 50% of HTE (-132 g/d), and 1% of HTN (-443 g/d) steer. The remaining steers lost weight. The percentage of HTN steers gaining weight was lower ($p = 0.05$) than all other groups, HTE differed ($p = 0.05$) from all groups except STE, and percentages did not differ among STE, STN, HON, HOE, SON, and SOE steers. Means separation test ranked and grouped (alpha = 0.05) treatments from high to low ADG: [SOE, SON], [SON, HOE, HON, STE, STN], [STN, HTE], [HTE, HTN]. As main effects, weight gain was greater ($p = 0.03$) for E vs. N (375 vs. 169 ± 85 g/d), greater ($p < 0.01$) for S vs. H (505 vs. 39 ± 85 g/d), and greater ($p < 0.01$) for O vs. T steers (567 vs. -23 ± 101 g/d). Forage, breed, and hormone therapy affected weight change in older steers during summer. Thermal status of steers may explain some of the variances in weight gain.

Key Words: Senepol, Tall fescue, Weight gain

Ruminant Nutrition: Beef cows and heifers

481 Fat supplementation and reproduction in beef females. R. N. Funston*, *University of Nebraska, Lincoln.*

Inadequate dietary energy intake and poor body condition can negatively affect reproductive function. Supplemental lipids have been used to increase energy density of the diet and may also have direct positive effects on reproduction in beef females. Several fatty acid sources have been studied as they relate to reproductive function. Plant derived oils appear to have the greatest impact on reproduction, common sources include: sunflower, safflower, cottonseed, rice hulls, and soybeans. Animal tallow and calcium salts of fatty acids escape rumen biohydrogenation to a greater extent and are incorporated into adipose tissue and milk. Effects on reproductive function appear to be more variable. Polyunsaturated fatty acids such as those in fishmeal also bypass the rumen but have been documented to affect reproductive processes. Fats have been fed before and after calving, during the breeding season, and during heifer development. Response to fat has been investigated through measuring: body weight and body condition score, age at puberty, postpartum interval, first service conception rates, pregnancy rates, calving interval, mammary gland development, milk yield, milk composition, calving difficulty, and calf birth and weaning weight. Animal response appears to be dependent on body condition score, age (parity), nutrients available in the diet (pasture or range conditions), and type of fat supplemented. To elucidate potential mechanisms of action scientists have investigated: changes in follicular and uterine development, hormonal profiles, brain function, and embryonic development. Feeding supplemental fat has resulted in varied and inconsistent results on reproductive function. Elucidating mechanisms of action of how supplemental fat can influence reproductive function has been a difficult process. The complexity of the reproductive system and makeup of fat supplements are often confounded by management conditions and forage quality both in research and commercial feeding situations. This has contributed to inconsistencies in research findings.

Key Words: Fat supplementation, Beef cattle, Reproduction