

466 The effect of phenotypic selection for milk production on hepatic expression of prolactin receptor. P. H. Luimes^{*1}, E. H. Beaupre¹, J. H. White¹, W. J. Weber², H. Chester-Jones², L. B. Hansen², B. A. Crooker², and J. R. Knapp¹, ¹University of Vermont, Burlington, ²University of Minnesota, St. Paul.

The effect of phenotypic selection for milk production on hepatic expression of the prolactin receptor gene was evaluated in a line of dairy cattle selected solely for milk production. Selection since 1964 resulted in increases of approximately 5500 kg of milk per lactation as compared to a control line. Liver biopsies were taken at -14, 14, 21 and 70 days relative to parturition (5 cows from each line). Total RNA was isolated and purified. Northern blots of the samples were hybridized with an RNA probe homologous to the extracellular portion of the bovine prolactin receptor. Normalization of RNA loading on the membranes was determined by hybridizing with an 18S RNA probe. RNA expression was quantified as relative pixel intensity. The selected cows had approximately 42% greater expression of prolactin mRNA at both 14 days prior to and after calving relative to the control cows ($P < 0.05$). These differences disappeared by day 21 such that, at days 21 and 70, there were no differences in prolactin receptor mRNA expression between selected and control cows. Little is known about the importance of prolactin on hepatic tissue metabolism in ruminants. These data suggest the prolactin receptor has a role in regulating hepatic metabolism in support of lactation, though the mechanism by which this occurs is unknown.

Key Words: Prolactin receptor, Milk yield, Phenotypic selection

467 Quantitative analysis of estrogen-related receptor α , estrogen receptor α and estrogen receptor β mRNAs throughout bovine mammary gland development. E. E. Connor^{*1}, A. V. Capuco¹, T. S. Sonstegard¹, A. F. Mota¹, D. L. Wood¹, W. Garrett¹, G. L. Bennett², and J. Williams³, ¹USDA-ARS, Beltsville, MD, ²USDA-ARS, Clay Center, NE, ³Roslin Institute, Roslin, Midlothian, Scotland.

The estrogen-related receptor α (ESRRA) belongs to the steroid hormone receptor family and is thought to function in regulation of estrogen-responsive genes including lactoferrin and medium-chain acyl coA dehydrogenase. The role of ESRRA in bovine mammary gland development and function is unknown. Expression of ESRRA mRNA was characterized in mammary parenchyma obtained from multiple stages of bovine mammary gland development in relation to estrogen receptor α (ESR1) and estrogen receptor β (ESR2) using quantitative real-time RT-PCR. Stages of development included prepubertal heifers, pregnant heifers, lactating non-pregnant cows, lactating pregnant cows and non-lactating pregnant cows ($n = 2$ to 3 animals/stage). In addition, the *ESRRA*, *ESR1* and *ESR2* genes were mapped to chromosomes 29, 9 and 10, respectively by linkage and radiation hybrid mapping. Results indicated expression of ESRRA mRNA was greatest in mature cows, regardless of state of pregnancy or lactation and ranged from 20 to 120-fold more than ESR1 and ESR2 transcripts. Expression of ESR2 mRNA

Physiology: Gamete physiology

469 Combining *in vitro* embryo production and sexed semen technologies. R. D. Wilson^{*}, K. A. Weigel, P. M. Fricke, M. L. Leibfried-Rutledge, D. L. Matthews, and V. R. Schutzkus, University of Wisconsin - Madison, Madison, WI.

The objective of this research was to explore the synergy between sexed semen and *in vitro* embryo production and to assess costs and benefits of these technologies on commercial farms. Genetically superior cull cows were used as donors, and ovaries were collected via colpotomy or at the time of slaughter. Oocytes were aspirated from the ovaries, fertilized 20-24 hours later, and matured to the blastocyst stage. Embryos were transferred into recipient cows and heifers on the same farms. Seven Wisconsin herds have participated thus far, and 154 embryos have been produced from 55 donor cows. Sexed semen from three Holstein sires was used. On average, 2.8 ± 3.3 transferable embryos were created per donor. Individual farms ranged from 1.5 to 4.3 embryos per donor. Recipient data revealed interesting trends. Recipient cows that showed standing estrus had a conception rate of 0.16 ± 0.37 , while those resulting from a synchronization program had a mean conception rate of 0.21 ± 0.41 . Recipient heifers (all with standing estrus) had a mean conception rate of 0.50 ± 0.52 . Interestingly, recipients that were synchronized

was low across all physiological stages and generally less than ESR1 and ESRRA. In pregnant heifers (approx. 100-200 d of pregnancy), levels of all three transcripts were at their lowest or non-detectable. Similar decreases during pregnancy have been reported for mice and may indicate down-regulation by high levels of estradiol during this developmental period. In prepubertal heifers, ESR1 mRNA was at its maximal level of expression but was half as abundant as ESRRA. Our results demonstrate expression of ESRRA, ESR1 and ESR2 mRNAs in bovine mammary gland and suggest a functional role of ESRRA in mammary gland development and lactation.

Key Words: Estrogen receptors, Mammary gland, Bovine

468 Effects of varying energy intakes on estrogen receptor, cell proliferation, and tissue composition in mammary tissue of pre-pubertal heifers. J. W. Forrest^{*1}, R. M. Akers¹, R. E. Pearson¹, E. G. Brown², M. J. VandeHaar², and M. S. Weber Nielsen², ¹Virginia Tech, Blacksburg, ²Michigan State University, East Lansing.

Our objective was to determine how varying energy intakes between 2 and 14 wk of age affect mammary parenchymal development. At 2 wk of age, Holstein calves were assigned to 1 of 4 treatments (HH, HL, LH, and LL) with 2 levels of energy intake (High or Low) and 2 periods of growth (2 to 8 and 8 to 14 wk of age). Period 1 gains were 379 and 666 g/d for L and H calves, respectively. Period 2 gains were 439 and 1095 g/d for L and H calves. At 14 wk, parenchyma at the stromal interface (I), mid-gland (M), and above the cistern (C) were collected, fixed, and embedded in paraffin. Digital images of stained sections were used to determine tissue composition (% epithelial, luminal, and stromal area). Immunocytochemistry revealed estrogen receptor and Ki67 (nuclear proliferation antigen) positive cells (ER⁺ and Ki67⁺). Epithelial area was not affected by treatment (18.0 to 20.9%). However, luminal and stromal areas were $3.5 \pm 1.4\%$ lower ($p < 0.01$) and $4.0 \pm 1.7\%$ higher ($p < 0.01$), respectively, in LL+LH heifers compared to HH+HL heifers. Zone I contained $3.9 \pm 1.5\%$ less ($p < 0.01$) lumen and $5.3 \pm 1.8\%$ more ($p < 0.005$) stroma than zones M and C. Treatment did not alter percent ER⁺ epithelial cells, but there was a tendency ($p < 0.2$) for zones M and C to have more ER⁺ cells than zone I. Percent ER⁺ cells in subtending ducts (SUBs) and terminal ductular units (TDUs) was $47.2 \pm 1.2\%$ and $53.2 \pm 1.4\%$. Percent proliferating cells tended ($p < 0.2$) to be higher in zone I compared with zones M and C. Ki67⁺ labeling in TDUs and SUBs was $2.1 \pm 0.8\%$ ($p < 0.01$) and $1.4 \pm 0.7\%$ ($p < 0.05$) higher for LL+LH heifers compared with HH+HL heifers. Percent Ki67⁺ cells for SUBs and TDUs was $4.4 \pm 0.5\%$ and $5.1 \pm 0.5\%$, respectively. A high rate of gain between 2 and 8 wk of age resulted in greater luminal area but reduced cell proliferation in mammary parenchyma at 14 wk of age. Positive effects of a reduced rate of gain on cell growth became evident only after 2 months of age.

Key Words: Heifers, Mammary, Calves

to ovulate one day later (than for conventional embryo transfer) had slightly higher conception rates than other recipients in both cows (0.21 ± 0.41 vs. $0.19 \pm .40$) and heifers (0.67 ± 0.52 vs. 0.38 ± 0.52). These results, although preliminary, suggest that low cost *in vitro* embryo production may have promise as an early system for utilizing sexed semen in dairy cattle breeding programs.

Key Words: In vitro production, Sexed semen

470 Timed insemination of superovulated heifers with sexed sperm. J. L. Schenk^{*1}, W. B. Henderson², and G. E. Seidel, Jr.³, ¹XY, Inc., ²Cyagra/EmTran, ³Colorado State University.

The objective was to study production of transferable embryos in superovulated Holstein heifers following a fixed-time single insemination with sex-sorted (2×10^6 or 20×10^6) or non-sexed (40×10^6) cryopreserved sperm. Sexed inseminates were enriched for the X-chromosome (90%) by flow sorting using a MoFlo[®] SX sperm sorter. Three subgroups of 12 heifers each were allocated to one of 3 Holstein bulls. Each heifer within a subgroup was inseminated with semen from each treatment. Heifers received a CIDR[®] on Day 0 and were superstimulated starting

on Day 4 using twice daily i.m. injections of FSH (Follitropin®-V) for 4 days (40, 30, 20, 10 mg). PGF₂α (40 mg) was injected i.m. on Day 6 p.m. and Day 7 a.m. (25 mg). The CIDR® was removed on Day 7 p.m. Heifers were artificially inseminated (AI) one time, 70–72 h following PGF₂α. Ova/embryos were collected nonsurgically 7 days after AI. Heifers not responding to superstimulation were not flushed and omitted from the analysis. Percentage data were transformed to the arc sine for ANOVA. Least squares means are presented in the table. Fewer ova were fertilized with sexed treatments relative to non-sexed and as sexed dosage was reduced to 2 x 10⁶ sperm (P<0.05). Assuming an embryonic sex ratio of 9:1 with sexed sperm and 1:1 ratio with non-sexed sperm, more embryos of the desired sexed can be obtained with 20 x 10⁶ total sex-selected sperm following timed AI in superovulated heifers.

Treatment	No. flushes	No. ova	% Fertilized	% Degenerate	No. transferable
40 x 10 ⁶					
Non-sexed	33	4.4	72 ^a	22	3.1 ^a
20 x 10 ⁶					
Sexed	34	4.4	49 ^b	17	2.0 ^b
2 x 10 ⁶	31	4.2	28 ^c	11	1.3 ^b

^{a,b,c} Means without common superscripts differ (P<0.05).

Key Words: Sex, Sperm, Superovulation

471 Fertility and distribution of estrus among cows following prostaglandin induced embryonic/fetal mortality. T. W. Geary*, USDA-ARS, Fort Keogh LARRL, Miles City, MT.

Late embryonic mortality occurs in approximately 10% of beef cattle. The objective of this study was to evaluate the distribution and fertility of estrus following early pregnancy loss in beef cattle. Pregnant cows (n = 124) and non-pregnant cows (control; n = 173) were divided across 2 yr to receive PGF (25 mg, i.m.) at d 25 (PG25; n = 40), 30 (PG30; n = 43), or 35 (PG35; n = 41) of gestation or during the mid-luteal phase of their estrous cycle (controls). Control cows were further divided into three approximately equal groups to receive PGF on the same dates as PG25, PG30, and PG35 cows. All cows were placed with fertile bulls immediately after PGF and were observed for estrus twice daily for 45 (PG25 and 60 control cows), 40 (PG30 and 56 control cows), or 35 d (PG35 and 56 control cows). Pregnancy was confirmed among PG25, PG30, and PG35 cows by ultrasonography and detection of a fetal heart-beat at the time of PGF (d 0). Synchronization rate (5-d) was greater (P < 0.05) in yr 2 (87%) than yr 1 (77%), and greater (P < 0.05) for PG35 (98%) and PG30 (91%) cows than control (78%) or PG25 (72%) cows. The interval from PGF to estrus was 4.0 ± 0.2, 4.6 ± 0.4, 4.1 ± 0.4, and 3.3 ± 0.4 d for control, PG25, PG30, and PG35 cows, respectively (P > 0.10). Synchronized pregnancy rates were higher (P < 0.05) for PG30 (66%) and PG35 (68%) cows than for PG25 (40%) cows. Synchronized pregnancy rates of control cows (54%) were not different (P ≥ 0.10) than previously pregnant cows. Breeding season pregnancy rates (yr 1) were lower (P < 0.05) for control cows (84%) than for PG35 (100%) cows, but not different (P > 0.10) than pregnancy rates of PG25 (95%) or PG30 (95%) cows. In summary, cows that received PGF early during gestation exhibited an estrus of normal fertility within 5 d. Cows that experience early pregnancy losses during a breeding season likely exhibit a fertile estrus soon afterwards to prevent low overall breeding season pregnancy rates from being realized in beef cow herds.

Key Words: Embryonic mortality, Synchronization, Fertility

472 Insulin like growth factor-I (IGF-I), IGF binding proteins (IGFBP), and steroids in dominant follicles of postpartum beef cows. F. J. White*, I. Rubio, C. A. Lents, N. H. Ciccioli, R. P. Wettemann, and L. J. Spicer, Oklahoma Agricultural Experiment Station, Stillwater.

The effect of interval before the first postpartum estrus and ovulation on IGF-I, IGFBP, and steroids in dominant follicles (DF) was evaluated in Angus x Hereford cows. Growth of DF (> 9 mm) was monitored daily by ultrasonography and fluid from DF was collected in vivo at either 22 to 28 d or 42 to 48 d postpartum. Follicular fluid (FF) was also aspirated from DF of contemporary proestrous cows. Estrous behavior was monitored continuously with HeatWatch, and progesterone in plasma collected twice weekly was used to access luteal activity. Time of follicular aspiration was classified as short (< 35 d) or long (>35 d) interval

before the first estrus and ovulation, or proestrus. Amounts of IGFBP and steroids in FF were not influenced by day postpartum. However, the amounts of IGFBP-3 and -4b (20-kDa) in FF were greater (P < 0.05) in DF aspirated < 35 d before the first estrus, or at proestrus, than in DF aspirated > 35 d before estrus. Concentrations of progesterone in FF were less (P < 0.01) in DF > 35 d (30 ± 6 ng/mL) than in DF < 35 d (81 ± 15 ng/mL) before estrus and in proestrous follicles (91 ± 10 ng/mL). Concentrations of androstenedione in FF were greater (P < 0.01) in proestrous follicles (41 ± 10 ng/mL) than in DF aspirated at > 35 d (4 ± 5 ng/mL) and < 35 d (10 ± 2 ng/mL) before the first postpartum estrus, and tended (P = 0.08) to be greater in DF < 35 d than in DF > 35 d before estrus. Proestrous follicles had greater (P < 0.01) estradiol (538 ± 148 ng/mL) than DF > 35 d (72 ± 39 ng/mL) or < 35 d (95 ± 32 ng/mL) before estrus. Concentrations of IGF-I in FF and plasma were not influenced by reproductive stage. In conclusion, estradiol production by DF of postpartum anestrous cows may be limited by decreased androstenedione production, and alterations in IGFBP in FF during the postpartum interval may influence follicular maturation.

Key Words: Beef cow, IGF-I, Insulin like growth factor binding proteins

473 Effect of dietary fat prepartum on first ovulation and reproductive performance in lactating dairy cows. M. Frajblat and W.R. Butler*, Cornell University, Ithaca, NY.

The objective of this study was to test the effects of prepartum and postpartum (PP) dietary supplements on the interval to first ovulation and reproductive performance. Multiparous Holstein cows (n=81) were fed isoenergetic diets (2.9 or 4.6 % fat; supplemental fat was prilled long chain fatty acids, Energy Booster) for 3 weeks preceding calving and control or glucogenic supplemented diets (0.23 kg/d of soluble sugars and 0.29 kg/d of Ca propionate) during the first 4 weeks PP. Daily energy balance (EB) was determined from calving to day 30 PP. Ovarian follicular development was monitored by ultrasonography and blood samples were analyzed for estradiol, progesterone, insulin, IGF-I, NEFA, and IGFBP's (ligand-blot). Beginning after day 55 PP, cows were injected with prostaglandin F2α (PGF) every Friday and were inseminated following estrus. Cows remained on the PGF schedule until estrus was detected or day 100 PP. Thereafter, cows were inseminated at every observed estrus prior to 220 days PP and PGF was used when cows were palpated non-pregnant after insemination. There was no effect of prepartum fat supplementation or PP glucogenic supplementation on any metabolic or hormonal parameter nor on follicular dynamics PP. By survival analysis earlier first PP ovulation was associated (P < 0.05) with less negative EB, less BCS loss, lower NEFA prepartum and PP. IGFBP-3, but not plasma IGF-I levels, tended (P<0.08) to be more abundant in cows with ovulatory first dominant follicle. Both ovulation prior to 50 days of lactation (P < 0.05) and prepartum supplemental fat (P < 0.03) were associated with a higher pregnancy rate during lactation. For cows fed supplemental fat prepartum, pregnancy rate was 86% versus 58% in controls (median PP days to pregnancy = 110 and 141, respectively). Effects of PP supplementation on first ovulation or pregnancy rate were non-significant. In conclusion, prepartum supplemental dietary fat and earlier first PP ovulation significantly increased pregnancy rate during lactation.

Key Words: Prepartum fat, Pregnancy rate, Cows

474 Ovarian follicular populations before weaning in sows are dependent on GnRH-induced LH release. C. J. Bracken*, B. L. McCormack, T. C. Cantley, R. P. Radcliff, and M. C. Lucy, University of Missouri.

The factors affecting follicular growth and the variation in weaning to estrus and weaning to ovulation intervals in sows are poorly understood. The objective was to determine if follicular populations before weaning in sows are dependent on GnRH-induced LH release. The posterior vena cava anterior to the ovarian vein was cannulated in 8 sows at 10.6 ± 0.7 d after farrowing. Blood samples were collected thrice daily (0700, 1500, and 2300 h) beginning on the day of cannulation and continuing until ovulation. Serum FSH and estradiol concentrations were measured by radioimmunoassay. Sows were randomly assigned to receive either 2 mL of GnRH (1µg/mL, n=4) or 2 mL saline (n=4) every 0.5 hour for 48 hours beginning 96 h before weaning and ending 48 h before weaning (weaning = 17.4 ± 0.6 d after farrowing). Average follicular diameter was determined once daily by transrectal ultrasonography. Follicular diameter (P < 0.001) and serum estradiol concentrations (P < 0.05)

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.

Hour	Estradiol pg/mL*		FSH ng/mL*		Diameter (mm)*	
	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

*Ismeans ± SEM

^astart of infusion, ^bend of infusion, ^cday 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 ($1 = .77 \pm .02$, $2 = 1.13 \pm .13$ and $3 = 1.61 \pm .20$ 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. 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 ($n = 55$; 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. J. F. Baker*¹, R. D. Randel², and C. R. Long², ¹University of Georgia, Tifton, GA/USA, ²Texas Agricultural Expt. Station, Overton, TX/USA.

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