

compared to healthy animals ( $18.8 \pm 0.41$ ;  $P < 0.001$ ), and the metritic cows also spent less time feeding ( $164.2 \pm 11.04$  min/d compared to  $204.9 \pm 5.72$  min/d for healthy animals;  $P = 0.002$ ). As in our previous work, metritic animals spent less time feeding during the pre-calving period ( $185.3 \pm 11.04$  min/d) compared to cows that remained healthy ( $214.8 \pm 5.72$  min/d;  $P = 0.002$ ). However, there was no difference in DMI between these two groups before calving. These results indicate that reduced time at the feeder pre-calving is a better indicator for identifying dairy cows at risk for metritis than reduced DMI.

**Key Words:** Feeding, Transition, Metritis

**M14 The impact of colostrum supplement processing on serum IgG levels in Holstein neonates.** K. J. Whitman<sup>\*1</sup>, J. R. Wenz<sup>1</sup>, F. B. Garry<sup>1</sup>, A. N. Merritt<sup>2</sup>, A. N. Putnam<sup>2</sup>, and J. H. Crabb<sup>2</sup>, <sup>1</sup>Colorado State University, Fort Collins, <sup>2</sup>Immucell Corp, Portland, ME.

Efforts to change current processing methods of colostrum supplements to increase absorbable immunoglobulin levels are being evaluated. Commercially available spray-dried (SD) product may provide less available immunoglobulin G (IgG) for absorption than freeze-dried (FD) product, due to a loss of heat labile IgG during the spray drying

process. The objective of this study was to evaluate the impact of pasteurized colostrum supplement processing (SD vs FD), and blood gas effects on serum IgG levels of newborn calves. Thirty singleton Holstein bull calves ( $43 \pm 3.6$  kg) born without assistance were used. Whole blood was collected via jugular venipuncture at birth (0h) and 48h, and radial immunodiffusion was used to determine serum levels of IgG. At 0h, arterial blood was collected from the brachial artery for immediate blood gas analysis. At approximately 1h after birth and at approximately 12h after birth, calves were fed either a FD or SD powdered colostrum supplement in 1.4L of warm water via a bottle or esophageal feeder. At 0h, 53% of calves were hypoxic ( $pO_2 < 58$  mmHg), and 30% were acidemic ( $pH < 7.3$ ), however, when compared to normal calves, these blood gas parameters had no impact on passive transfer ( $P = 0.70$ ). There was no difference in mean IgG of SD (1110 mg/dl) vs. FD (981 mg/dl) fed calves or % calves with failure of passive transfer at 48hr. Results of this study indicate that serum IgG was similar, regardless of processing method, and hypoxemia or processing method had no impact on passive transfer. The impact of pasteurization in colostrum supplement processing on absorbable IgG should be investigated in the future.

**Key Words:** Colostrum supplement, IgG, Processing

## Beef Species

**M15 Impact of feedlot morbidity on performance, carcass characteristics and profitability of New Mexico ranch to rail steers.** J. W. Waggoner<sup>\*1</sup>, C. P. Mathis<sup>1</sup>, C. A. Loest<sup>1</sup>, J. E. Sawyer<sup>2</sup>, and F. T. McCollum, III<sup>3</sup>, <sup>1</sup>New Mexico State University, Las Cruces, <sup>2</sup>Texas A&M University, College Station, <sup>3</sup>Texas A&M University, Amarillo.

Records from steers enrolled in the New Mexico Ranch to Rail program (n = 813) from 2001 to 2004 were utilized to evaluate feedlot morbidity effects on performance, carcass characteristics and profitability. Steers were classified based on number of medical treatments during the finishing period. Classifications were: zero medical treatment (HEALTHY), one medical treatment (ONE), and two or more medical treatments (TWO(+)). Data were analyzed by analysis of variance and contrasts evaluated differences between HEALTHY and sick (ONE and TWO(+)) steers and between ONE and TWO(+). Initial calf market value, carcass grid value structure, and unit feed cost were standardized to remove market variation. Steers were assigned to marketing groups based on ultrasonographic prediction of individual optimum marketing dates. Twenty-two percent (177 hd) of 813 steers received medical treatment. Net income (Table 1) was greatest among HEALTHY steers and declined among steers for ONE and TWO(+) (HEALTHY vs. sick,  $P < 0.01$ ; ONE vs. TWO(+),  $P < 0.01$ ). Sick steers (ONE and TWO(+)) exhibited lower ADG, spent more days on feed, and had lower carcass values than HEALTHY steers (HEALTHY vs. sick,  $P < 0.01$ ). Total cost of gain increased as the number of medical treatments increased (HEALTHY vs. sick,  $P < 0.01$ ; ONE vs. TWO(+),  $P < 0.01$ ). Analysis of records from steers in the New Mexico Ranch to Rail program confirms and quantifies the effects of morbidity on feedlot performance, carcass value and profitability.

**Table 1. Effects of morbidity on performance and profitability of steers**

Item	HEALTHY	ONE	TWO(+)	SEM	H vs S	1 vs 2+
Days on feed	192	197	209	7.0	<0.01	0.11
ADG, kg	1.45	1.39	1.26	0.77	<0.01	0.12
Cost of gain, \$/kg	1.26	1.43	1.76	0.06	<0.01	<0.01
Carcass value, \$/kg	2.51	2.39	2.18	0.10	<0.01	0.06
Net income, \$/hd	14.01	-69.63	-253.70	25.93	<0.01	<0.01

Zero (HEALTHY), one (ONE), or two or more (TWO(+)) medical treatments. Contrasts: H vs S = HEALTHY vs. sick (ONE and TWO(+)); 1 vs 2+ = ONE vs. TWO(+).

**Key Words:** Morbidity, Feedlot, Steers

**M16 Management factors affecting selling prices of Arkansas beef calves.** T. R. Troxel<sup>\*</sup>, B. L. Barham, S. Cline, J. Foley, D. Hardgrave, R. Wiedower, and W. Wiedower, *University of Arkansas Cooperative Extension Service, Little Rock.*

The objective of this study was to determine how management factors affected the selling price of beef calves. Data were collected from January 1 to December 31, 2005 at fifteen Arkansas livestock auctions. The database consisted of 52,401 lots consisting of 105,542 head of cattle representing 18.2% of the total calves sold. Information was collected by experienced livestock market news reporters and included body condition, castration, horn status, fill, health, and individual or group selling. Each factor was analyzed using GLM procedures using weight as a covariate, and least-squared means were generated and separated using the pdiff option. All prices are based on dollars per 45.45 kg of live weight. Body condition affected selling price ( $P < 0.0001$ ) with very thin, thin, average, and fleshy and fat calves selling for \$119.55, \$116.80, \$118.14, \$112.28 and \$101.98, respectively. The

selling prices of steers, bulls and heifers were different from each other ( $P < 0.001$ ) and were \$124.20, \$117.93 and \$112.81, respectively. Polled calves sold for \$3.70 more ( $P < 0.001$ ) than horned calves. Fill affected selling price ( $P < 0.0001$ ) with gaunt, shrunk, average, full and tanked calves selling for \$119.63, \$120.22, \$116.77, \$110.05 and \$92.80, respectively. Healthy calves sold for \$118.21, which was higher ( $P < 0.001$ ) than dead hair (\$105.55), stale (\$100.01), sick (\$80.22), bad eye(s) (\$104.39) or lame (\$84.74) calves. Calves that were announced as preconditioned sold for a higher price (\$122.36;  $P < 0.001$ ) than healthy calves. The selling prices of calves sold as singles, groups of 2 to 5 head or groups of six or greater were \$117.26, \$120.12 and \$122.61, respectively ( $P < 0.001$ ). Cattle classified as calves sold for \$118.73, which was higher than cattle classified as yearlings (\$116.89;  $P < 0.001$ ). Beef cattle producers can greatly influence the selling prices of their calves through managing calf body condition, castration, horns, fill, health and group selling.

**Key Words:** Selling price, Beef calves, Auctions

**M17 Impact of the phenotypic expression of calf genetics on the selling price of Arkansas beef calves.** T. R. Troxel, B. L. Barham\*, S. Cline, J. Foley, D. Hardgrave, R. Wiedower, and W. Wiedower, *University of Arkansas Cooperative Extension Service, Little Rock.*

A study was conducted to evaluate the impact of the phenotypic expression of calf genetics on the selling price of beef calves marketed through Arkansas auction barns. Data was collected on 52,401 lots consisting of 105,542 head marketed through fifteen auction barns in 2005. Data collection was conducted by experienced livestock market news reporters. Information pertaining to the phenotypic expression of calf genetics included subjective identification of breed, color, and USDA frame and muscle scores. Due to the unbalanced nature of the dataset, variables were analyzed individually using the GLM procedure in SAS with calf weight and month of sale as covariates, and least-square means were generated using the PDIF option when a significant F test was noted. All prices are based on dollars per 45.45 kg of live weight. Breed, color (independent of breed), frame and muscle impacted ( $P < 0.001$ ) feeder calf price. Twenty-three breed or breed groupings were evaluated. Angus by Hereford (\$121.74), Angus (\$121.43), Charolais by Limousin (\$121.33), Angus by Limousin (\$120.83), Angus by Charolais (\$120.59), and Hereford by Angus by Brahman (\$120.01) calves brought a higher selling price ( $P < 0.01$ ) than all other breeds. Brahman (\$108.24), Hereford (\$107.25),  $\frac{1}{4}$  Brahman (\$106.25) and Longhorn/Longhorn cross calves (\$89.38) were lower in price ( $P < 0.001$ ) compared to other breeds. Yellow-white faced (\$120.44), yellow (\$120.29), and black-white faced (\$120.03) calves were similar in selling price but brought a higher selling price ( $P < 0.001$ ) compared to all other calf colors. Spotted calves (\$107.37) received the lowest selling price ( $P < 0.001$ ). The selling prices for large- (\$118.27) and medium- (\$118.15) framed calves were similar ( $P > 0.10$ ) but were higher ( $P < 0.001$ ) than small-framed calves (\$95.43). Price also differed ( $P < 0.001$ ) for muscle scores 1, 2, 3 and 4 (\$120.54, \$111.31, \$96.28 and \$82.21, respectively). Breed, color, frame score and muscling score are all important factors that can influence buyers decisions at Arkansas auction barns.

**Key Words:** Feeder calves, Market price, Genetic factors

**M18 A meta-analysis study on the effect of maturity and implant status on carcass characteristics.** M. J. McPhee\*, J. W. Oltjen, T. R. Famula, and R. D. Sainz, *University of California, Davis.*

A meta-analysis was conducted to assess the effects of breed type (early-moderate, **EMM** or late maturity, **LM**) and implant status (estrogenic (**E**) or combination (**C**) or non-implanted (**N**); repeats included) on hot carcass weight (**HCW**, kg), longissimus muscle area (**LMA**, cm<sup>2</sup>), kidney, pelvic and heart fat (**KPH**, %) and intramuscular fat (**IMF**, %), at harvest. Forty-two publications from 1982 to June 30 2004 with consistent IMF data were evaluated. The Mixed model procedure in SAS was used where the statistical model included the fixed-effect terms maturity and implant status; 12/13<sup>th</sup> rib fat (BF, cm) as a covariate; all two-way interactions; and intercept-slope and source (the subject in Proc Mixed) as random-effect terms. Source of publication was the experimental unit. A weighted term ( $w_2$ ) was used for LMA, KPH and IMF where,  $w_2 = w_1/\text{mean}$ , and  $w_1 = \text{inverse of the squared SE}$ . The unstructured (UN) covariance structure was used to determine if the intercept-slope covariances were correlated. When the intercept-slope covariances were correlated then a model without the covariance structure was fitted. The estimate for intercept-slope covariance was not statistically different from 0 for LMA ( $P = 0.11$ ), KPH ( $P = 0.19$ ) and IMF ( $P = 0.74$ ), therefore a reduced model without a covariance component was fitted for these carcass characteristics. For HCW ( $P = 0.01$ ) the model had a covariance component fitted. The results for maturity indicate differences between EMM and LM for HCW ( $P < 0.01$ ) and LMA ( $P < 0.01$ ) and no differences for KPH ( $P = 0.26$ ) and IMF ( $P = 0.50$ ); for implant status - single or repeat application of an estrogenic or combination implant increased HCW by 2.9% or 5.7%; increased LMA by 3.7% or 6.4%; decreased IMF 8.1% or 5.2% respectively and decreased KPH by 7.6% for estrogenic implants and increased KPH by 1.1% for combination implants compared to a non-implanted steer.

**Key Words:** Beef Cattle, Maturity, Implants

**M19 Growth performances of Angus Plus calves grazing on pasture in Hawaii subtropical climates.** J. Yang\*<sup>1</sup>, M. DuPont<sup>1</sup>, G. Fukumoto<sup>1</sup>, and R. Ferreira<sup>2</sup>, <sup>1</sup>*University of Hawaii, Honolulu,* <sup>2</sup>*Olumau Angus Plus LLC, Lihue, HI.*

Cows and calves are fed by 100% grazing on pastures in Hawaii islands, which are characterized by plentiful sunshine and rainfall with average monthly temperature of 25 to 30°C and average monthly precipitation of 46 mm to 121 mm. To evaluate the suitability of Angus Plus cattle for Hawaii subtropical climates, we collected the data of the growth performances of 149 Angus Plus calves in the past three years (2003-2005). Angus Plus calves were produced by maintaining the purebred lines of Angus or Brangus between 65% and 96% black Angus and a minimum of 4% Brahman. The Angus Plus cattle herd have been selected for preweaning gain, daily gain on pasture grass after weaning, fertility and mothering ability. All the animals were raised on 100% improved pastures of Pangola (*Digitaria decumbens*, *Stent*), Rhodes (*Chloris gayana*) and Guinea (*Panicum maximum Jacq.*) throughout the year. Data for birth weight (BWT), pre-weaning average daily gain adjusted to 205 days (PWADG) were obtained. Average birth weight of calves was  $37.1 \pm 1.24$ ,  $34.7 \pm 0.51$  and  $34.2 \pm 0.51$  kg in 2003, 2004 and 2005, respectively, and hip height at birth was  $73.4 \pm 0.46$  cm in 2003,  $72.4 \pm 0.23$  cm in 2004 and  $71.9 \pm 0.20$  cm in 2005. The mean of 205 d-adjusted weight was  $252.8 \pm 6.63$  kg in 2003,  $265.4 \pm 8.69$  kg in 2004, and  $247.4 \pm 3.41$  kg in 2005. Average preweaning daily gain based on the adjusted 205 day is  $1.05 \pm 0.03$ ,  $1.10 \pm 0.13$ , and  $1.04 \pm 0.15$  kg/d for year 2003, 2004 and 2005, respectively. Interestingly, the birth weight is significantly correlated with hip height at birth ( $r=0.730$ ,  $P < 0.001$ ), preweaning daily gain ( $r = 0.527$ ,  $P < 0.001$ ) and adjusted 205 d weight ( $r = 0.510$ ,  $P < 0.001$ )

based on three-year pooled data. However, the hip height at birth is not significantly correlated to the hip height at weaning ( $P > 0.05$ ). These results demonstrated great performances of Angus Plus calves raised on 100% pasture in Hawaii subtropical climates. The combination of Angus with Brangus to produce Angus Plus cattle have the potential to contribute to the growing demand of forage-based production of high-quality natural and organic beef for the local and international markets

**Key Words:** Angus Plus cattle, Grazing, Growth

**M20 Age at first calving and the longevity of beef cows of different breeds.** F. Szabo\* and I. Dakay, *University of Veszprem Georgikon Faculty of Agriculture, Keszthely, Hungary.*

The age at first calving, lifespan and longevity of cows have great importance in beef cattle husbandry because the cost of raising weaned calves depends largely on age at first calving and how long a cow remains in production. If cows are productive extendedly and raise more progeny, specific costs of raising each calf decrease proportionally. Consideration of lifespan and, specifically, longevity plays an important role in practical breeding. The objective of the present work was to evaluate the impact of breed type on age at first calving (AFC), age at culling (ACU), and longevity (LONG; the period between first calving and culling) in beef cows. A database of 2115 cows belonging to five breeds (Hungarian Grey, Hereford, Aberdeen Angus, Limousin and Charolais) and two crossbred genotypes (Simmental x Hereford F1, Simmental x Limousin F1) born between 1977-1992 was evaluated using multivariate analysis considering breed type, birth year, and birth month. The mean values of AFC, ACU and LONG obtained were 2.71, 9.47 and 6.77 years, respectively. Breed/genotypes and birth year had significant influence ( $P < 0.01$ ) on each evaluated trait, whereas birth month statistically affected only the AFC. The period between first calving and culling (LONG) of the mentioned breed types were 8.95, 9.08, 8.28, 7.81, 7.91, 10.79, and 5.55 years, respectively.

**Key Words:** Age at first calving, Age at culling, Lifespan

**M21 Determining the corn replacement value of wet brewers grains for feedlot cattle.** J. W. Homm\*, L. L. Berger, and T. G. Nash, *University of Illinois, Urbana.*

Due to increasing energy costs, breweries are marketing brewers grains as wet feeds. The purpose of this trial was to evaluate the corn replacement value of wet brewers grains (WBG) for finishing cattle. Two hundred heifers ( $287.8 \pm 34.5$  kg) were randomly assigned to four dietary treatments containing either 0%, 15%, 30%, or 45% WBG on a DMB. The control diet consisted of 15% corn silage, 75% whole high-moisture corn and 10% soybean meal-based supplement on a DMB. The control diet was balanced to contain 13.0% crude protein, 0.4% calcium, 0.3% phosphorus and 0.6% potassium. Two full weights were averaged at the initiation of the trial and carcass adjusted live weight was used to determine the final live weight. Heifers were pen-fed (5 pens per treatment, 10 heifers per pen) for 160 d. Live weight and feed efficiency were not significantly different between dietary treatments. Dry matter intake and average daily gain were quadratic ( $P < 0.01$ ), where 15% and 30% WBG heifers consumed more feed and grew faster than 0% and 45% WBG heifers. Additionally, 15% and 30% heifers consumed more ( $P = 0.01$ ) feed than 45% heifers. Heifers receiving the 15% and 30% WBG diets gained more ( $P < 0.01$ ) than 45% heifers. Ultrasonic marbling was higher ( $P < 0.05$ ) for heifers fed 0% WBG than heifers fed WBG at the start of the trial. Heifers fed 30% WBG had higher ( $P = 0.03$ ) ultrasonic marbling scores than heifers fed 15% at the start of the trial. After 112 d on feed (DOF), heifers fed 30% WBG had higher ( $P = 0.03$ ) ultrasonic marbling scores than heifers fed 15% WBG. At harvest, carcass marbling tended ( $P = 0.06$ ) to be higher for heifers not fed WBG than those fed WBG. Carcass REA was larger ( $P = 0.05$ ) for the 15% and 30% WBG heifers than the 45% WBG heifers. Kidney, pelvic, and heart (KPH) fat increased linearly ( $P < 0.05$ ) as WBG increased in the diet. Additionally, 15% heifers had less ( $P = 0.04$ ) KPH fat than 30% heifers. These data indicate that feeding 15-45% WBG in feedlot diets supports performance and carcass characteristics similar to cattle fed a typical high-moisture corn finishing diet.

**Key Words:** Wet brewers grains, Beef, Performance

## Breeding and Genetics I

**M22 Crossbreed dairy cattle production in the tropical area in Mexico.** R. Lopez\*, C. Vite, J. G. Garcia-Muñiz, and P. A. Martinez, *Universidad Autonoma Chapingo, Chapingo, Mexico.*

The objective was to determine the effect of grade of crossing (G), lactation number (LN), calving season (CS), parity (P) and its interactions on milk yield per lactation (TMY), daily MY (DMY), MY per day of calving interval (CIMY), peak milk yield (PMY), days to peak milk yield (DPMY), lactation length (LL), age at first calving (AFC), days open (DO), and calving interval (CI) of  $\frac{3}{4}$  Zebu (Z) x  $\frac{1}{4}$  Swiss (S), 3Z1S;  $\frac{3}{4}$  Holstein (H) x  $\frac{1}{4}$  Z, 3H1Z;  $\frac{3}{4}$  S x  $\frac{1}{4}$  Z, 3S1Z;  $\frac{1}{2}$  H x  $\frac{1}{2}$  Z, HZ; and  $\frac{1}{2}$  S x  $\frac{1}{2}$  Z, SZ cows. Records of 237 lactations of 230 cows collected from 1997 to 2004 in three commercial dual-purpose farms of Veracruz, México, were analyzed. Cows were grazing tropical pastures and were supplemented with 3.0 kg of TMR per cow per d at milking time. Moreover, cows were machine milked twice a day applying 0.25 mL of commercial Oxytocin (Oxytocin-S, Intervet, Tonisvorst, Germany) at each milking to help milk down. Milk yield per lactation, DMY, CIMY, PMY, DPMY, LL, DO and CI were analyzed

with a linear model of fixed effect including G, LN, P, and CS; whereas AFC was analyzed with a linear model of fixed effects including G, LN, and year and season of birth of cows. Results indicated cows genotype had affected ( $P < 0.05$ ) TMY and LL. In contrast, cow genotype did not affect ( $P > 0.05$ ) DMY, PMY, CIMY and DPMY. The range of MY in 270 days of milking was  $2719 \pm 511$ ,  $4961 \pm 416$ ,  $4349 \pm 231$ ,  $4070 \pm 238$ , and  $3676 \pm 175$  kg for 3Z1S, 3H1Z, 3S1Z, HZ and SZ, respectively. Likewise, LN did influence TMY, DMY, PMY, and CIMY, however, did not show any impact on LL. In contrast, P and calving season did not have an influence on all the traits studied. Cows 3H1Z had better AFC than 3S1Z, HZ, and SZ (33.0 vs. 39.6, 33.2 and 34.9 mo, respectively). In addition, F1 animals showed shortest DO and CI than the others genotypes. In conclusion, the crossover of locally adapted breeds with European breeds reduce the age to the sexual maturity especially in the F1 animals and increase MY.

**Key Words:** Dual-purpose cattle, Supplementation, Tropical forages