

## Production, Management and the Environment: Beef 2

**1000 Effects of anabolic implants on growth and carcass traits of feedlot steers and heifers: A meta-analysis.** C. D. Reinhardt\*<sup>1</sup> and L. R. Corah<sup>2</sup>, <sup>1</sup>Kansas State University, Manhattan, <sup>2</sup>Certified Angus Beef, Manhattan, KS.

Data from 82 studies (60 steer and 22 heifer studies) were compiled and analyzed to evaluate the effects of anabolic implants on feedlot performance and carcass traits. Dependent variables in the model included ADG, G:F, DMI, dressing percentage, HCW, and marbling score. Categories created for type and dosage of active compound were: low dose primarily estrogenic hormone (E2; LOW), moderate dose E2 (MOD), intermediate dosage combination E2 + trenbolone acetate (TBA; INT), and full-strength TBA or E2 + TBA (HIGH). Treatment categories were: no implant, single MOD, single HIGH, delayed HIGH, initial and terminal MOD, initial and terminal INT, initial LOW and terminal HIGH, initial MOD and terminal HIGH, initial INT and terminal HIGH, and initial and terminal HIGH. Implant treatment was the fixed effect in the model, and trial was a random effect. Increasing the implant dosage (potency of individual implants or reimplant vs. single implant) increased ADG, G:F, and HCW in both steers and heifers ( $P < 0.01$ ). Increasing implant dosage in steers decreased marbling score ( $P < 0.01$ ) but did not affect yield grade ( $P = 0.11$ ). Increasing implant dosage in heifers decreased yield grade and marbling score ( $P < 0.01$ ) so that when marbling score was adjusted to a common yield grade, there was no effect of implant on marbling score ( $P = 0.52$ ). The percentage of Prime and Choice carcasses increased at a decreasing rate with increased marbling score, fitting the equation: Percent Prime + Choice =  $(\sin[-2.2144 + 0.00548 * \text{Marbling score}]) * 100$ ; ( $R^2 = 0.86$ ). Implants reduce marbling content of steers, but high-potency implant programs will have a decreasing impact on quality grade in cattle with high average marbling score compared with cattle with low average marbling score.

**Key Words:** carcass, feedlot, implant

**1001 Factors affecting Certified Angus Beef acceptance in spring-born, black-hided beef calves.** G. D. Fike\*<sup>1</sup>, M. E. King<sup>1</sup>, L. R. Corah<sup>1</sup>, and W. D. Busby<sup>2</sup>, <sup>1</sup>Certified Angus Beef LLC, Wooster, OH, <sup>2</sup>Iowa Tri-County Steer Carcass Futurity, Lewis.

Logistic regression was used to determine factors affecting Certified Angus Beef (CAB) acceptance in black-hided beef calves ( $n = 966$ ) born during the springs of 2002 to 2007 at a central Missouri ranch. After weaning, all calves were fed, implanted and managed similarly each year in a southwest Iowa feedlot and were harvested when visually determined to have one cm of fat cover. Calves born in 2006 were excluded from the analysis because percent Angus of the calf could not be determined. For categorical variables, the odds ratio (OR) for each variable category was the odds of calves in that category qualifying for the CAB program compared with calves in the reference category ( $OR = 1$ ). The OR for continuous variables was the odds of calves qualifying as CAB for each unit increase in the continuous variable. Gender and percent Angus of the calf significantly affected CAB acceptance. Steers were 0.59 times as likely to qualify as CAB as heifers. Calves that were 0–25% or 26–50% Angus were 0.45 and 0.38, respectively, times as likely to meet CAB requirements as were calves that were 51–100% Angus. CAB acceptance tended ( $P = 0.06$ ) to be influenced by time of birth within the calving season. The oldest calves (born during the first 21 d) tended to be twice as likely to be CAB than the youngest calves (born >63 d into the calving season). As adjusted final weight ( $OR =$

1.014) and back fat thickness ( $OR = 2.93$ ) increased, the odds of CAB acceptance were higher. The odds of CAB acceptance were lower in calves with higher feedlot ADG ( $OR = 0.35$ ) and heavier delivery weight/d of age ( $OR = 0.003$ ). These data indicate that CAB acceptance is affected by gender, percent Angus, delivery weight/d of age, ADG, back fat thickness and adjusted final weight and tends to be influenced by time of birth in spring-born, black-hided beef calves.

**Key Words:** CAB acceptance, spring-born beef calves, percent Angus

**1002 Effect of time of birth within the spring calving season on performance and carcass traits of beef calves fed in the Iowa Tri-County Steer Carcass Futurity.** G. D. Fike\*<sup>1</sup>, M. E. King<sup>1</sup>, L. R. Corah<sup>1</sup>, and W. D. Busby<sup>2</sup>, <sup>1</sup>Certified Angus Beef LLC, Wooster, OH, <sup>2</sup>Iowa Tri-County Steer Carcass Futurity, Lewis.

Calves ( $n = 1,369$ ) from a central Missouri ranch born from 2002 to 2007 were used to determine the effect of birth sequence within a spring calving herd on feedlot performance and carcass traits. After weaning, all calves were fed, implanted and managed similarly each year in a southwest Iowa feedlot in the Iowa Tri-County Steer Carcass Futurity program and were harvested when visually determined to have 1 cm of fat cover. Calving sequence periods were defined as: d 1–21 (early = E); d 22–42 (mid-early = ME); d 43–63 (mid-late = ML); d > 63 (late = L). The effect of birth sequence on continuous outcomes was quantified using one-way ANOVA. Chi-squared analysis was used to determine the effect of birth sequence on rates. E calves were heavier at feedlot delivery than ME, ML and L calves (328.2, 321.7, 310.8 and 291.4 kg, respectively;  $P < 0.05$ ). Adjusted final and hot carcass weights were greater for E than for L calves (554.2 vs. 538.6 kg and 341.1 vs. 332.5 kg, respectively;  $P < 0.05$ ), but were similar to ME and ML calves. The percentage of Angus in the E calves was greater than ME, ML and L calves (49.3, 44.9, 39.4 and 43.3%, respectively;  $P < 0.05$ ). Disposition scores were lower for E and ME calves than for L calves ( $P < 0.05$ ). ADG for E calves was less than ML calves (1.46 vs. 1.53 kg/d;  $P < 0.05$ ), but not different from ME or L calves. L calves had better feed efficiency than E and ME calves (6.72, 7.14 and 7.03 kg/kg, respectively;  $P < 0.05$ ). Marbling scores were greater for E and ME calves than ML and L calves ( $P < 0.05$ ). The percentage of calves grading USDA Choice decreased as calves were born later in the calving season ( $P = 0.009$ ), and Certified Angus Beef (CAB) acceptance rate followed a similar pattern in black-hided calves ( $P < 0.0001$ ). Calves born during the first 21 d of the spring calving season had heavier delivery, adjusted final and carcass weights; greater marbling scores and a higher percentage grading Choice and CAB than their latest born counterparts.

**Key Words:** beef calves, carcass and performance, CAB acceptance

**1003 Effects of roughage source and dried corn distiller's grains concentration on feedlot performance and carcass characteristics.** C. L. Maxwell\*<sup>1</sup>, M. S. Brown<sup>1</sup>, N. A. Cole<sup>2</sup>, B. Coufal<sup>1</sup>, J. O. Wallace<sup>1</sup>, J. Simroth-Rodriguez<sup>1</sup>, and S. Pratt<sup>1</sup>, <sup>1</sup>West Texas A&M University, Canyon, <sup>2</sup>USDA ARS Conservation and Production Research Laboratory, Bushland, TX.

Physical attributes of roughages used in finishing diets may impact the extent of ruminal digestion of dried distillers grains (DDG) and growth performance. Crossbred steers ( $n = 380$ ) were adapted to a common finishing diet, blocked by BW, implanted with Revalor-S (120 mg of

trenbolone acetate and 24 mg of estradiol), and assigned to treatments of roughage source (sorghum-sudan hay [SH] or sorghum-sudan silage [SS]) and DDG concentration (0 or 20% of diet DM). Cattle were housed in 40 soil-surfaced pens with at least 16.7 m<sup>2</sup> of pen space and 30.5 cm of bunk space/animal. Roughages were included on an equal NDF basis. All diets contained 3.4% non-protein N from urea (1.2% urea) and cottonseed meal was utilized as a protein source in 0% DDG diets. Cattle were fed twice/d for 108 d (initial BW = 410 ± 13 kg). Steers fed 20% DDG ate 4.1% more DM than steers fed 0% DDG (10.42 vs. 10.85 kg,  $P = 0.007$ ), but SS or SH did not influence DMI ( $P = 0.55$ ). Overall shrunk ADG on a live basis was not altered by treatment ( $P > 0.57$ ). Gain efficiency on a live basis was not altered by SS or SH ( $P = 0.77$ ), but steers fed 0% DDG were 2.8% more efficient than steers fed 20% DDG ( $P = 0.008$ ). There was a roughage source × DDG interaction for carcass-adjusted ADG and gain efficiency, dressing percentage, hot carcass weight, and LM area ( $P < 0.08$ ). Adjusted ADG was increased 7% by 20% DDG with SS ( $P = 0.05$ ), but not with SH ( $P = 0.39$ ). Gain efficiency was reduced ( $P = 0.03$ ) 4.8% by 20% DDG with SH, but was not altered ( $P = 0.71$ ) with SS. Dressing percentage was reduced by 20% DDG with SH (63.0 vs. 62.4,  $P = 0.02$ ) and increased by 20% DDG with SS (62.4 vs. 63.3,  $P < 0.001$ ). Hot carcass weight was not altered by DDG with SH, but was increased 8 kg by 20% DDG with SS. The LM area was increased by 20% DDG with SS ( $P = 0.02$ ), but not with SH ( $P = 0.29$ ). Marbling score was higher when DDG was fed with SS or SH (380 vs. 390,  $P = 0.06$ ). Results suggest that rate of gain on a carcass basis can be improved by feeding DDG with SS, but performance can be reduced when DDG is fed with SH.

**Key Words:** feedlot cattle, growth performance, dried distiller's grains

**1004 The relative importance of weaning management and vaccination history on finishing performance and carcass characteristics of beef calves.** M. J. Macek<sup>\*1</sup>, K. C. Olson<sup>1</sup>, J. R. Jaeger<sup>2</sup>, T. B. Schmidt<sup>3</sup>, D. U. Thomson<sup>1</sup>, J. W. Iliff<sup>1</sup>, and L. A. Pacheco<sup>1</sup>, <sup>1</sup>Kansas State University, Manhattan, <sup>2</sup>Western Kansas Agricultural Research Center, Hays, <sup>3</sup>Mississippi State University, Starkville.

Angus × Hereford calves (n = 437; average initial BW = 208 ± 25 kg) were stratified by BW, sex, and age and assigned randomly to 1 of 3 weaning treatments that corresponded to length of time between maternal separation and shipping to a feedlot: 45, 15 or 0 d. Within each weaning treatment, calves were assigned randomly to 1 of 2 BRD-vaccination treatments: vaccinated 14 d before maternal separation and again at weaning (PRE) or vaccinated on the d of arrival at the feedlot and again 14 d later (POST). On a common shipping date, calves were transported 3 h to an auction market and held for 12 h. Calves were then transported 1 h to a feedlot. All calves were fed the same diets ad libitum during the weaning (PRESHIP), receiving, and finishing phases of the experiment. Steers were fed to a harvest endpoint of 11.5 mm subcutaneous fat over the 12th rib and harvested in 3 groups. Calves weaned 45 d PRSHIP required fewer ( $P = 0.02$ ) days on feed than calves weaned 15 or 0 d PRESHIP. Calf ADG during finishing was greater ( $P < 0.01$ ) for 45- and 15d calves than for 0-d calves, whereas ADG was similar ( $P = 0.26$ ) between PRE and POST. Consequently, 45-d calves had greater ( $P < 0.01$ ) harvest BW than 15- or 0-d calves. Carcass weight tended to increase ( $P < 0.02$ ) as the length of the weaning period increased. Marbling score, USDA yield grade, 12th-rib fat thickness, REA, and KPH were similar ( $P \geq 0.22$ ) between weaning and vaccination treatments. Likewise, incidence of liver abscesses was similar ( $P < 0.47$ ) between weaning and vaccination treatments. Incidence of lung lesions was not affected ( $P > 0.81$ ) by weaning treatment; however, POST

tended ( $P < 0.09$ ) to have greater incidence of lung lesions than PRE. Ranch-of-origin weaning for 45 d was associated with increased carcass weight but similar growth performance during finishing and carcass merit compared with weaning for 15 d. PRESHIP BRD vaccination did not improve growth performance or carcass merit of ranch-direct cattle relative to BRD vaccination deferred until feedlot arrival.

**Key Words:** carcass merit, preconditioning, weaning

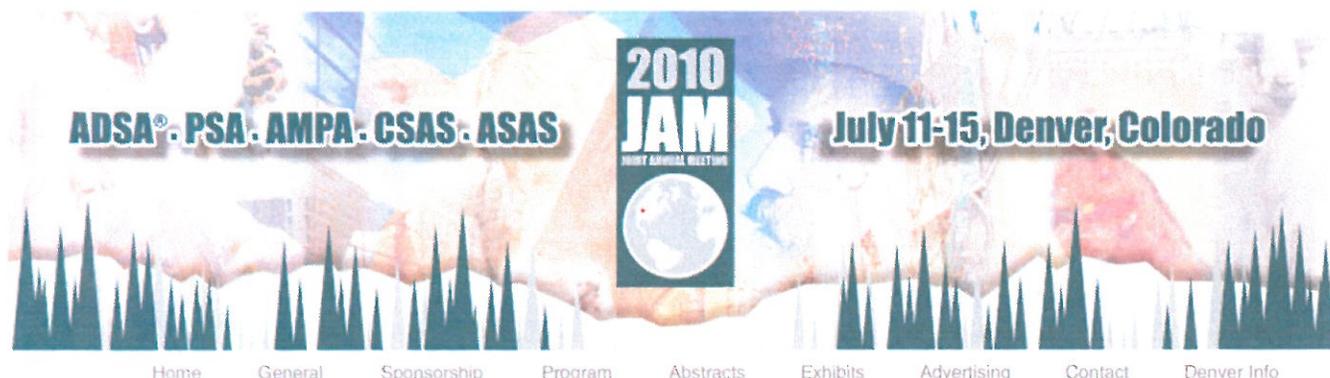
**1005 Effects of degree of respiratory disease vaccination on health and growth performance of ranch-direct beef calves during weaning and receiving.** M. J. Macek<sup>\*1</sup>, J. R. Jaeger<sup>2</sup>, T. B. Schmidt<sup>3</sup>, D. U. Thomson<sup>1</sup>, J. W. Bolte<sup>2</sup>, L. A. Pacheco<sup>1</sup>, N. A. Sproul<sup>1</sup>, L. R. Hibbard<sup>1</sup>, G. J. Eckerle<sup>1</sup>, and K. C. Olson<sup>1</sup>, <sup>1</sup>Kansas State University, Manhattan, <sup>2</sup>Western Kansas Agricultural Research Center, Hays, <sup>3</sup>Mississippi State University, Starkville, MS.

Angus × Hereford calves (n = 430; initial BW = 230 ± 31.8 kg) were stratified by sex, age, and BW and assigned randomly to 1 of 4 treatments: 0, 1, 2, or 3 BRD vaccinations before feedlot placement (NOVACC, VACC1, VACC2, or VACC3, respectively). Calves were removed from their dams 29 d before feedlot placement; they were weighed, vaccinated for clostridial diseases, treated for internal and external parasites, and placed in a ranch-of-origin weaning facility. Calves on VACC1, VACC2, and VACC3 treatments were given an initial BRD-vaccination at that time. Calves were revaccinated according to their respective treatments at 14-d intervals during the ranch-of-origin weaning phase of the experiment (PRESHIP). On a common shipping date, calves were transported 3 h to an auction market and held for 12 h. Calves were then transported 1 h to a feedlot. During the PRESHIP period, NOVACC calves tended ( $P = 0.06$ ) to have greater incidence of undifferentiated fever than VACC1, VACC2, or VACC3 calves. Consequently, NOVACC calves had greater ( $P < 0.01$ ) drug-therapy costs PRESHIP than other treatments. Calf ADG, DMI, and G:F during the PRESHIP period were similar ( $P \geq 0.61$ ) between treatments. Upon arrival at the feedlot, calves were weighed and assigned to a receiving pen based on treatment. Calf BW was similar ( $P \geq 0.48$ ) between treatments at feedlot placement, 27 d post-receiving, and 55 d post-receiving; moreover, calf ADG during receiving was similar ( $P < 0.92$ ) between treatments. Degree of BRD vaccination had no effect ( $P \geq 0.71$ ) on DMI or G:F during the receiving period. Incidence of undifferentiated fever among VACC2 calves was greater ( $P < 0.01$ ) than that among NOVACC, VACC1, or VACC3 calves during the receiving period; therefore, drug-therapy costs of VACC2 cattle were greater ( $P < 0.01$ ) than that of NOVACC, VACC1, and VACC3 cattle. Vaccination for BRD, regardless of degree, improved health of calves during the PRESHIP period but not DMI, ADG, or G:F. Degree of BRD vaccination influenced calf health during receiving but not DMI ADG, or G:F.

**Key Words:** beef calves, health, preconditioning

**1006 Influencing steer performance through maternal nutrition.** A. F. Summers<sup>\*1</sup>, K. H. Ramsay<sup>2</sup>, and R. N. Funston<sup>1</sup>, <sup>1</sup>University of Nebraska West Central Research and Extension Center, North Platte, <sup>2</sup>Rex Ranch, Ashby, NE.

A 2-yr study was conducted to determine the effects of maternal nutrition on male progeny. Two locations of a commercial ranch in the Nebraska Sandhills were used with crossbred spring-calving multiparous cows at one location (yr1 = 754; yr2 = 700) receiving higher levels of supplement (HN) and cows at the second location (yr1 = 673; yr2 = 766) being fed lower levels of supplement (LN). Cows were managed in a year-round grazing system with HN cows receiving the equivalent of



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