The influence of hide color and sex on carcass grading performance and value was evaluated on 18,575 carcasses.

- Cattle exhibited color frequencies of black (50.0%), black-white face (10.6%), red (10.6%), red-white face (5.8%), gray (4.9%), yellow (4.7%), white (3.5%), Holstein (2.7%), striped (2.4%), yellow-white face (2.2%), gray-white face (1.4%), and spotted (1.3%).
- Sex frequencies of 83.5% steers and 16.5% heifers.
- Black cattle (black and black-white face) had greater subcutaneous fat (0.58 in), hot carcass weight (800 lb), KPH (kidney, pelvic and heart fat; 2.38%), calculated YG (3.30) and marbling score (Small29) with less ribeye area (13 in²) than did nonblack cattle (0.49 in, 788 lb, 2.34%, 2.89, Small02, 13.5 in², respectively).
- Steers had less subcutaneous fat [0.46 in, KPH (2.22%)], calculated YG (2.83) and marbling score (Slight98) with greater hot carcass weight (821 lb) and ribeye area (13.9 in²) than did heifers (0.54 in, 2.47%, 3.11, Small19, 759 lb, 13.9 in², respectively).
- Black cattle had greater hot carcass weight discounts ($1.32), YG discounts ($2.46), and market value ($122.93) with less Quality Grade discounts ($2.07) than did nonblack cattle ($1.10, $1.73, $122.49, $3.46, respectively).
- Steers had less hot carcass weight discounts ($0.97) and YG discounts ($1.33) with greater Quality Grade discounts ($3.68) than did heifers ($1.43, $2.30, $2.56, respectively).

The results suggest that the incentives to pay premiums for feeder cattle based on hide color diminish once the finished animal is in the carcass form and that steer and heifer carcasses have differing carcass characteristics that could warrant independent, value-based marketing methods.

Case Study: Searching for the Ultimate Cow – The Economic Value of Residual Feed Intake at Bull Sales

(Case Study: Searching for the Ultimate Cow – The Economic Value of Residual Feed Intake at Bull Sales (McDonald et al., 2010. Montana State University))

Cow-calf producers seek to reduce costs and increase profits by selecting bulls that produce more efficient offspring. Organizers of formal bull auctions usually produce catalogs for potential buyers that advertise bull performance measures and genetic characteristics, including EPD and simple performance measures. Buyers use this information to make decisions regarding bull purchases based on heritable bull.
traits. Residual feed intake is a relatively new simple performance measure of feed efficiency. Residual feed intake, in addition to other simple performance measures, was collected during bull performance testing. Residual feed intake for each bull is calculated as the difference between actual and expected feed intake. Residual feed intake along with EPD and other simple performance measures were listed in the 2008 and 2009 sale catalogs.

• Analyses indicate that buyers were willing to pay more for bulls that were residual feed intake efficient.

• Bull purchasers were willing to pay $319 more for each 2.2 lb/day improvement (decrease) in residual feed intake.

• Buyers paid an additional $101 for each 2.2 lb improvement in birth to yearling birth weight EPD.

Although other performance measures (e.g., BW gain, birth weight and age) were valued more highly by bull purchasers, a residual feed intake could eventually be valued to the extent that a residual feed intake EPD might be developed.

**Tall Fescue Copper and Copper-Zinc Superoxide Dismutase Status in Beef Steers Grazing Three Different Fescue Types**

*Stewart et al., 2010. Virginia Polytechnic Institute and State University*

Copper status of steers (n = 24; 568 lb initial body weight) grazing tall fescue pastures was measured for two consecutive grazing seasons. The forages tested included ‘Kentucky-31’ wild-type endophyte-infected tall fescue, endophyte-free tall fescue and ‘Quantum’ tall fescue infected with endophyte AR542, a non-ergot, alkaloid-producing strain.

• Forage Copper concentration was similar across treatments.

• Steers consumed less Copper in year 1 than in year 2, and a period × treatment interaction was observed.

• Stepwise regression indicated that differences in dry matter intake accounted for 88% of the variation in Copper intake.

• Serum Copper concentration was not different among treatments.

• In year 1, liver Copper concentrations of cattle grazing endophyte-free tall fescue were greater than for cattle grazing endophyte-infected tall fescue, whereas liver Copper concentrations of steers grazing ‘Quantum-AR542’ were intermediate. No differences were detected in liver Copper concentrations among treatments in year 2.

These results suggest that the tendency for less Copper intake of steers grazing endophyte-infected tall fescue and ‘Quantum-AR542’ was related to the smaller dry matter intake on these pastures. The smaller Copper intakes likely contributed to differences in liver Copper.

**Comparison of Forage Sampling Method to Determine Nutritive Value of Bahiagrass Pastures**

*Hughes et al., 2010. University of Florida*

The objective of this study was to compare the nutritive value of forage selected by grazing cattle (masticate) with hand-collected forage samples from bahiagrass pastures. Forage and masticate samples were collected monthly at four locations within the state of Florida. Chemical composition of forage and masticate samples was determined, and selection indices (selection indices = \{[(masticate – hand-sampled analyte concentration)/hand-sampled analyte concentration] \times 100\} + 100) were calculated for in vitro digestible organic matter, crude protein and acid detergent fiber concentrations. Hand shears were used to collect hand-sampled forage, and masticate samples were collected using ruminally fistulated steers.

• Masticate samples had greater in vitro digestible organic matter and crude protein concentrations and lower acid detergent fiber concentration than hand-collected forage samples (60.0 vs. 48.7, 11.7 vs. 10.0 and 34.4 vs. 29.4%, respectively).

• A sampling type × month interaction existed for in vitro digestible organic matter, crude protein and acid detergent fiber during the study.

• The selection indices were greatest in the winter months of January and February for in vitro digestible organic matter, whereas the selection indices were lowest in June.
• The selection indices for acid detergent fiber were lowest in February, March and November compared with other months.
• Selection of crude protein tended to be affected by month.

Throughout the year, steers were able to selectively graze bahiagrass forage and consume a diet better than what would be predicted by collecting hand-sampled forage. Ultimately, understanding selection differences could influence supplementation decisions for cattle grazing subtropical forages.

Current Status of Sexed Semen Technology
(Seidel, 2010. Colorado State University)

For practical purposes, sexed semen first became commercially available in North America in 2006, using the Beltsville method of flow cytometry/cell sorting. No other method has proven effective for sexing semen. Several million doses of sexed semen have been produced to date at the industry standard of ~90% purity.

• Purity can be adjusted to exceed 95%, but sort rates decrease greatly at >90% purity. Thus, achieving such purity becomes very expensive. Sort rates increase at 75%-80% purity compared with 90% and decrease costs accordingly. Sort rates at 90% purity can exceed 5,000 live sperm/sec of each sex per sorter nozzle.
• When considering processing losses and other logistical issues, about 7-8 insemination doses of 2,000,000 sperm of each sex can be produced per sorter nozzle per hour under ideal conditions. This sperm dose became the industry standard as the optimal compromise between cost and fertility.
• Doubling the number of sexed sperm and/or insemination doses only increases pregnancy rates 2%-4% for most bulls.
• Under good management, proper semen handling, etc., for most bulls in properly controlled experiments, pregnancy rates with sexed semen at 2,000,000 sperm/dose generally fall between 70% and 90% of those of unsexed semen at conventional doses of ≥10,000,000 sperm.
• Numbers of good embryos recovered when superovulated donors are inseminated with sexed semen of most bulls are approximately half of numbers recovered after using conventional semen AI.
• ET pregnancy rates per embryo produced with sexed semen are normal.
• Calves produced via AI of sexed semen do not differ in any respect from those produced via conventional semen, although there is less dystocia with females than with male calves.

Procedures for sexing bovine sperm have improved in several small but important ways over the past decade. Further improvements in efficiency resulting in decreased costs are likely. The biggest challenge will be to improve fertility of sexed semen.

The Relative Importance of Weaning Management and Vaccination History on Performance by Ranch-Direct Beef Calves During Weaning and Receiving
(Macek et al., 2010. Kansas State University and Mississippi State University)

Angus × Hereford calves (n = 437; average initial body weight = 459 lb) were assigned randomly to 1 of 3 treatments that corresponded to length of time between weaning and shipping to a feedlot: 45, 15 or 0 days. Within each weaning period length, calves were assigned randomly to 1 of 2 bovine respiratory diseases-vaccination treatments: vaccinated 14 days before weaning and again at weaning or vaccinated on the day of arrival at the feedlot and again 14 days later. On a common shipping date, calves were transported 3 hours to an auction market and held for 12 hours. Calves were then transported 1 hour to a feedlot.

• Incidence of undifferentiated fever 15 days after weaning was greater for calves weaned 45 days before shipping than for calves weaned 15 days before shipping; however, average daily gain before shipping was greater for calves weaned 45 days than for those weaned 15 days.
• Incidence of undifferentiated fever and average daily gain before shipping were similar between calves vaccinated 14 days before weaning and again at weaning and calves vaccinated on the day of arrival at the feedlot and again 14 days later.
Average dry matter intake before shipping by 45-day calves was less than that by 15-day calves. Also, dry matter intake by calves vaccinated 14 days before weaning and again at weaning was less than calves vaccinated on the day of arrival at the feedlot and again 14 days later.

Incidence of undifferentiated fever during receiving was similar between weaning and vaccination treatments.

Calf average daily gains during receiving tended to be greater for 45- and 15-day calves than for 0 day calves.

Receiving DMI increased as number of days between weaning and shipping increased.

Conversely, the timing of vaccination did not affect average daily gain or dry matter intake during receiving.

Growth efficiency was similar among weaning and vaccination treatments.

Weaning more than 15 days before shipping did not improve health or growth of cattle that were moved from their ranch of origin to a feedlot within 16 hours and were not commingled with market-sourced cattle. Pre-shipment bovine respiratory disease vaccinations may not change health or performance of ranch-direct cattle relative to bovine respiratory disease vaccination deferred until feedlot arrival.

The Relationship of Bovine Respiratory Disease and Carcass Ultrasound Measures

Bovine respiratory disease has been identified as an economically relevant trait which lacks selection tools to reduce post-weaning incidence. The lack of sufficient field morbidity data has been a major obstruction to development of tools for genetic improvement. The objective of this study was to investigate the genetic associations among real-time carcass ultrasound measures and probability of treatment for Bovine respiratory disease. Phenotypes of 2,870 crossbred steers were collected over two years (1,551 in year 1; 1,319 in year 2). The ultrasound measurements were collected at 3 times during the feeding period: receiving (day 0), processing 2 (80 days) and processing 3 (150 days). Ultrasound measurements included ribeye area, backfat thickness and percent intramuscular fat. Morbidity data were collected over the entire 240-day feeding period and classified as a binary observation, 1 for treated and 0 for non-treated, respectively.

Heritability estimates of morbidity, ultrasound ribeye area, ultrasound backfat thickness and ultrasound percent intramuscular fat at first, second and third processing were 0.15, 0.10, 0.06, 0.20; 0.16, 0.11, 0.09, 0.12; and 0.15, 0.14, 0.11, 0.06, respectively.

Morbidity had a negative genetic correlation with all ultrasound measurements.

The genetic correlations with the greatest magnitude were between morbidity and ultrasound ribeye area, ultrasound backfat thickness and ultrasound percent intramuscular fat taken at receiving of −0.15, −0.58 and −0.11, respectively.

These results imply those individuals with smaller ribeye area and less backfat upon arrival to the feedlot have the highest probability of suffering from a Bovine respiratory disease incidence.

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