

# Beef Cattle Research Update

United States Department of Agriculture, University of Arkansas, and County Governments Cooperating

## Effect of Selection for Residual Feed Intake on Postpartum Performance of Brahman Cows

Loyd et al., Texas A&M University

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With the rising cost of feedstuffs, reducing feed expenses is important for livestock producers. Residual feed intake is a measure of feed efficiency developed to identify animals which may require less feed to achieve the same performance as their cohorts. This study investigated the postpartum performance of Brahman first-calf heifers (n=16) and multiparous cows (n=38) which had been evaluated postweaning for residual feed intake.

Females were weighed and evaluated for body condition score at 28-day intervals for three months prior to the expected start of the 2008 calving season. Females were weighed and evaluated for body condition score 24 hours and 21 days after calving. Serum samples were collected weekly beginning 21 days after calving for progesterone analysis to determine corpus luteum formation and functionality. After calving, females were exposed to vasectomized bulls fitted with chin-ball markers and were visually observed at least once per day to detect estrus.

Eight and 10 days following observed estrus, cows were examined using real-time ultrasonography to determine the presence of a corpus luteum. Females were assigned to a residual

feed intake group based on the sign of their residual feed intake values, where a negative residual feed intake = efficient and a positive residual feed intake = inefficient.

- Parity had a significant effect on all parameters evaluated; therefore, cows and heifers were analyzed separately.
- Prepartum and postpartum body weight and body condition score did not differ by residual feed intake group for either cows or heifers.
- Efficient cows exhibited estrus sooner ( $42 \pm 4.1$  vs.  $55 \pm 3.7$  days), developed a corpus luteum sooner ( $40 \pm 4.1$  vs.  $53 \pm 3.7$  days) and exhibited estrus in conjunction with corpus luteum formation sooner ( $42 \pm 4.1$  vs.  $54 \pm 3.9$  days) than inefficient cows.
- No difference was detected between efficient and inefficient heifers for estrus, corpus luteum formation or estrus with corpus luteum formation.

These data suggest that selection for efficient cattle using residual feed intake as a selection tool may result in a shorter postpartum interval in multiparous Brahman cows.

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## Effects of Tilmicosin Alone or in Combination With Mannheimia Haemolytica Toxoid Administered at Initial Feedlot Processing on Morbidity and Mortality of High-Risk Calves

*Bryant et al., Colorado*

A total of 3,996 high-risk steer calves were used to compare effects of metaphylactic treatment with Tilmicosin (Micotil®) alone or in combination with an adjuvanted Mannheimia haemolytica toxoid (Presponse®SQ) on health parameters and economic returns in a commercial feedlot setting.

- Steers receiving Micotil®-Presponse®SQ at processing had 17% fewer first-time treatments for BRD than calves in the Micotil® group and a 19% lower relapse rate.

- The Micotil®-Presponse®SQ calves had 22% less mortality than calves in the Micotil® group.
- Calves receiving Micotil®-Presponse®SQ had \$1.37 and \$13.14 lower therapy and mortality costs, respectively, than calves in the Micotil® group.

In total, combined processing, therapy, railer (culls) and mortality costs for Micotil®-Presponse®SQ calves were \$14.77 lower than for Micotil® calves.

## Corn Oil or Corn Grain Supplementation to Steers Grazing Endophyte-Free Tall Fescue: I. Effects on In Vivo Digestibility, Performance and Carcass Quality

*Pavan and Duckett, Clemson University*

Twenty-eight Angus (637 pounds) steers were used to evaluate the effect of isocaloric supplementation of two different energy sources to steers rotationally grazing tall fescue pastures for 197 days in comparison to positive and negative controls. Steers were supplemented with either corn grain (0.52% body weight on a dry matter basis) or soybean hulls plus corn oil (0.45% body weight on a dry matter basis + 0.10% body weight on an as-fed basis). Negative, pasture only, and positive, high-concentrate, control diets (85% concentrate:15% roughage on dry matter basis) were also included in the study. Steers on corn, soybean hulls plus corn oil and pasture-only treatments were managed together under a rotational grazing system, whereas high-concentrate control diet steers were fed a high-concentrate diet for the final 113 days.

- Energy supplementation decreased forage dry matter intake (% of BW) with respect to pasture only, but not total dry matter intake.
- There were no differences among grazing treatments on apparent total dry matter digestibility.
- Overall, average daily gain was greater in supplemented, regardless of type, than in nonsupplemented grazing treatments.
- During the final 113 days, average daily gain was greater in high-concentrate control diet steers than in the grazing treatments.

- Overall supplement conversion did not differ between supplement types and was less than high-concentrate control diets.
- Carcass traits did not differ between energy sources. Dressing percentage and hot carcass weight were greater in supplemented cattle than in pasture-only steers.
- Fat thickness and kidney, pelvic and heart fat percentage for pasture-only steers were less than for soybean hulls plus corn oil but did not differ from corn supplemented steers.
- Marbling score, rib eye area and quality grade did not differ between grazing treatments.
- Hot carcass weight for high-concentrate control diet steers was heavier than for pastured cattle. Quality and yield grades of high-concentrate control diet steer carcasses were also greater than for carcasses from pastured steers.

Energy supplementation, regardless of source, to grazing steers increased average daily gain, dressing percentage and carcass weight compared with pasture-only steers; however, supplemented steers had less average daily gain, efficiency, dressing percentage and carcass weight compared with high-concentrate finished steers.

## Effects of Commingling Beef Calves From Different Sources and Weaning Protocols During a 42-Day Receiving Period on Performance and Bovine Respiratory Disease

*Step et al., Oklahoma State University*

The study objective was to determine health and performance of ranch calves from different preconditioning strategies during a 42-day receiving period when commingled with calves of unknown health histories from multiple sources. Steer calves from a single source ranch (RANCH) were weaned and immediately shipped to a feedlot (WEAN, initial body weight = 545 pounds); weaned on the ranch for 45 days before shipping but did not receive any vaccinations (WEAN45, initial body weight = 509 pounds); or weaned, vaccinated with modified live viral vaccine and held on the ranch for 45 days before shipping (WEANVAC45, initial body weight = 604 pounds). Multiple-source steers were purchased through auction markets (MARKET, initial body weight = 525 pounds), and upon receiving, a portion of ranch-origin steers from each weaning group was commingled with a portion of MARKET cattle.

- Ranch-origin calves tended to have greater average daily gain than commingled or auction market purchased calves, although average daily gain was not affected by weaning management.
- Across the 42-day receiving period, dry matter intake was not affected by cattle

origin. However, auction market purchased calves, WEAN45 and WEANVAC45 calves consumed more dry matter than WEAN calves.

- Gain efficiency was not affected by treatment.
- Ranch-origin calves were less likely to be treated for bovine respiratory disease than auction market purchased calves; commingled calves were intermediate.
- Calves that were retained on the ranch after weaning (WEAN45 and WEANVAC45) were also less likely to be treated than auction market purchased calves or WEAN calves.
- As expected, differences in morbidity related to differences in health costs. Calves of WEAN45 and WEANVAC45 had less health costs than auction market purchased calves and WEAN calves.

Calves from a single source that are retained on the ranch for 45 days after weaning exhibit less morbidity and lower health costs during the receiving period at the feedyard than when cattle are commingled or trucked to the feedyard immediately after weaning.

## Animal Performance and Economic Comparison of Novel and Toxic Endophyte Tall Fescues to Cool-Season Annuals

*Beck et al., University of Arkansas*

Increased costs of annual establishment of small grain pasture associated with fuel, machinery and labor are eroding the profitability of stocker cattle enterprises. Interest has therefore increased in development of cool-season perennial grasses that are persistent and high quality. This study occurred on 53 acres (divided into thirty 0.81-acre paddocks) located at the University of Arkansas Division of Agriculture Livestock and Forestry Branch Station, near Batesville. Two tall fescue cultivars infected with novel endophytes, Jesup and HiMag, were established in September 2002. Jesup and HiMag were compared with endemic endophyte Kentucky 31 tall fescue; wheat and cereal rye planted in September 2003, 2004 and 2005; and annual ryegrass planted in September 2004 and 2005. Each year, 3 steers (1.5 steers/acre) were

placed on each pasture for fall and winter grazing, and 5 steers (2.0 steers/acre) were placed on each pasture for spring grazing.

- Body weight gain per acre of steers grazing novel endophyte tall fescue was greater than those grazing Kentucky 31 tall fescue and cereal rye during 2003 to 2004; whereas, in 2004 to 2005, body weight gain per acre for steers grazing novel endophyte tall fescue and annual ryegrass did not differ and was greater than that of cereal rye, which was greater than that of Kentucky 31 tall fescue.
- During 2005 to 2006, body weight gain per acre was greater for steers grazing annual ryegrass than those grazing novel endophyte tall fescue and cereal rye, which did not differ.

- Body weight gain per acre was least for steers grazing Kentucky 31 tall fescue.
- Average net return of novel endophyte tall fescue was greater than Kentucky 31 tall fescue, but profitability of novel endophyte tall fescue did not consistently differ from cool-season annuals. Across the three-year study, novel endophyte tall fescue produced

net returns per acre of \$88; this level of profitability would require four years for a new planting of novel endophyte tall fescue to break even.

Novel endophyte tall fescues offer potential benefits related to decreased risk of stand establishment of annual forage crops, longer growing season and acceptable animal performance.

## Impact of Age and Source Verification of Calves on Value Received Via Video Auctions

*Kellom et al., Montana State University*

The objective of this project was to determine if a premium was being paid for source- and age-verified feeder calves via video auction. Data on 68,665 Montana calves marketed during June and July of 2007 were provided by Superior Livestock Video. Average sale weight of all calves was 584 lb, and average sale price was \$1.17/lb with an average lot size of 116 calves. Thirty-one percent of all calves sold were age and source verified, 60% were steers, 15% were weaned from their dam and 88%

were vaccinated prior to shipment (VAC 34 or VAC 35 protocols). When calculated for a 600-lb calf, the premium received for source and age verification was \$12.83. Other premiums received for this weight of calf were (\$/head): vaccinated, \$14.81; weaned, \$17.64; steers, \$52.43 more than heifers. The authors concluded when calves were source and age verified, weaned and/or followed a vaccination protocol, additional dollars were received when marked via a video auction.



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