

# CATTLEMEN'S DAY 2015

## BEEF CATTLE RESEARCH

SUMMARY PUBLICATION



# CATTLEMEN'S DAY 2015



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RESEARCH



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# Calcium Hydroxide-Treated Corn Stover (Second Crop): An Energy Source in Growing and Receiving Diets

*Tyler Spore*

**Objective:** Evaluate effects on performance of calcium hydroxide-treated corn stover (Second Crop; ADM Corp., Decatur, IL) substituted for traditional roughage sources, such as prairie hay and alfalfa, in growing and receiving cattle diets.

**Study Description:** 245 steers were divided into three treatment groups and fed their respective diets for 112 days, with a 7-day rumen equalization period following the 112th day. Diets contained 0, 20, or 40% calcium hydroxide-treated corn stover (control, 20%CaOH, and 40%CaOH, respectively). Cattle were evaluated for health problems and fed their test diets morning and evening. Cattle were revaccinated and weighed on day 28, and final weights were measured on day 119 following a 7-day period of feeding a common diet to equalize rumen fill.

**Results:** Performance of the control and 20%CaOH groups did not differ, but cattle fed 40% of the treated stover had poorer average daily gain than cattle in the control group and were less efficient during the first 28 days of the feeding period.

### Growth performance of beef calves fed Second Crop corn stover

| Item                      | Treatment |          |          | SEM   | PR > F | 20%              | 40%              |
|---------------------------|-----------|----------|----------|-------|--------|------------------|------------------|
|                           | Control   | 20% CaOH | 40% CaOH |       |        | CaOH vs. control | CaOH vs. control |
| Body weight, lb           |           |          |          |       |        |                  |                  |
| Day 0                     | 559       | 559      | 559      | 38.2  | 0.79   | 0.97             | 0.55             |
| Day 119                   | 860       | 860      | 836      | 64.6  | 0.03   | 0.95             | 0.02             |
| Average daily gain, lb    |           |          |          |       |        |                  |                  |
| Days 1–28                 | 2.90      | 2.85     | 2.16     | 0.497 | <0.01  | 0.71             | <0.01            |
| Days 1–119                | 2.53      | 2.53     | 2.33     | 0.245 | 0.03   | 0.95             | 0.02             |
| Dry matter intake, lb/day |           |          |          |       |        |                  |                  |
| Days 1–28                 | 13.78     | 13.89    | 13.24    | 0.637 | 0.41   | 0.83             | 0.30             |
| Days 1–119                | 18.35     | 18.89    | 18.07    | 0.900 | 0.53   | 0.46             | 0.71             |
| Feed:gain                 |           |          |          |       |        |                  |                  |
| Days 1–28                 | 5.21      | 5.22     | 6.51     | 1.062 | <0.01  | 0.96             | <0.01            |
| Days 1–119                | 7.33      | 7.65     | 7.87     | 0.574 | 0.42   | 0.43             | 0.20             |

**The Bottom Line:** Feeding calcium hydroxide-treated corn stover at 20% of the diet dry matter in a growing and receiving diet yields performance similar to that of a more traditional diet, whereas 40% inclusion of treated corn stover negatively affects performance.



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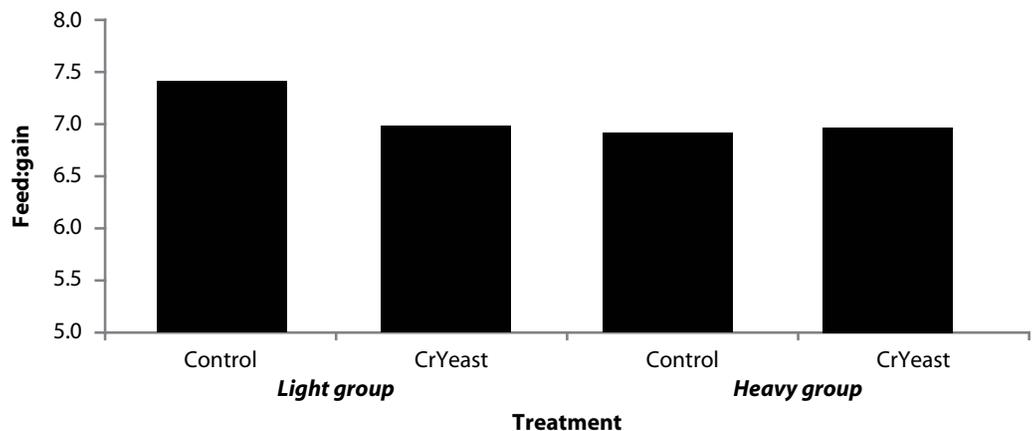
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# Dietary Chromium Propionate Combined With Yeast Minimally Affects Growth Performance and Carcass Traits of Finishing Steers

*Cadra Van Bibber-Krueger*

**Objectives:** Compare feedlot performance, carcass characteristics, and plasma glucose profiles of steers fed finishing diets with and without a combination of chromium propionate and yeast.

**Study Description:** Steers (n = 504; body weight = 886 lb) were sorted by body weight and randomly assigned to receive 0 (Control) or 3.3 g/day of a combination of chromium propionate and yeast supplementation (CrYeast). Steers were further divided into heavy and light weight groups, with 21 animals per pen. Plasma samples were collected on days 49 and 94 from 5 steers per pen for analysis of glucose concentration. Pens were weighed every 21 days, and harvest data were collected at the end of the finishing phase.



**The Bottom Line:** Chromium propionate in combination with yeast may improve feed efficiency for cattle with lighter body weights entering the feedlot, but it had no further benefit to feedlot performance or carcass traits.



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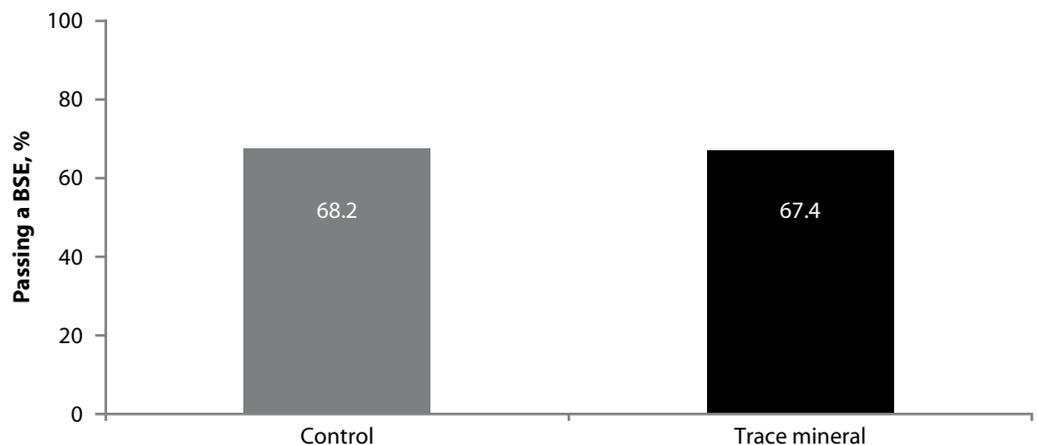
## Can an Injectable Trace Mineral Product Improve Reproductive Parameters in Developing Yearling Beef Bulls?

*Alissa Kirchoff*

**Objective:** Determine if using an injectable trace mineral product in developing beef bulls, in addition to dietary mineral supplementation, improves semen quality and ability to pass a yearling breeding soundness examination.

**Study Design:** Nine-month-old bulls ( $n = 90$ ) were injected subcutaneously with 1 mL/100 lb body weight of an injectable trace mineral product (Multimin 90; Multimin USA, Fort Collins, CO) containing zinc, copper, selenium, and manganese (trace mineral), or a saline placebo (control). Blood was collected at 0, 8, and 24 hours after injection. Semen was collected and breeding soundness examinations were performed on days 42 and day 91 after injection. Blood and semen were evaluated for trace mineral concentrations, and semen was evaluated for sperm characteristics. Body weights and scrotal circumferences also were measured.

**Results:** Body weights and scrotal circumferences were similar between treatments. Bulls treated with the trace mineral product had elevated blood mineral concentrations at 8 hours post-injection. At 24 hours post-injection, Cu and Zn had returned to levels comparable to control bulls, whereas Se and Mn remained elevated compared with bulls in the control treatment. Sperm characteristics did not differ between treatments at either 42 or 91 days posttreatment, although on day 42 bulls treated with the trace mineral tended to have greater sperm concentrations in semen. Bulls from the control and trace mineral treatments also did not differ in their ability to pass a yearling breeding soundness exam at 91 days.



Percentage control and trace mineral bulls passing a yearling breeding soundness exam at day 91 post-treatment ( $P = 0.93$ )

**The Bottom Line:** Injectable trace mineral did not improve sperm quality or ability to pass a yearling breeding soundness examination in developing beef bulls when dietary trace mineral supplementation was adequate.



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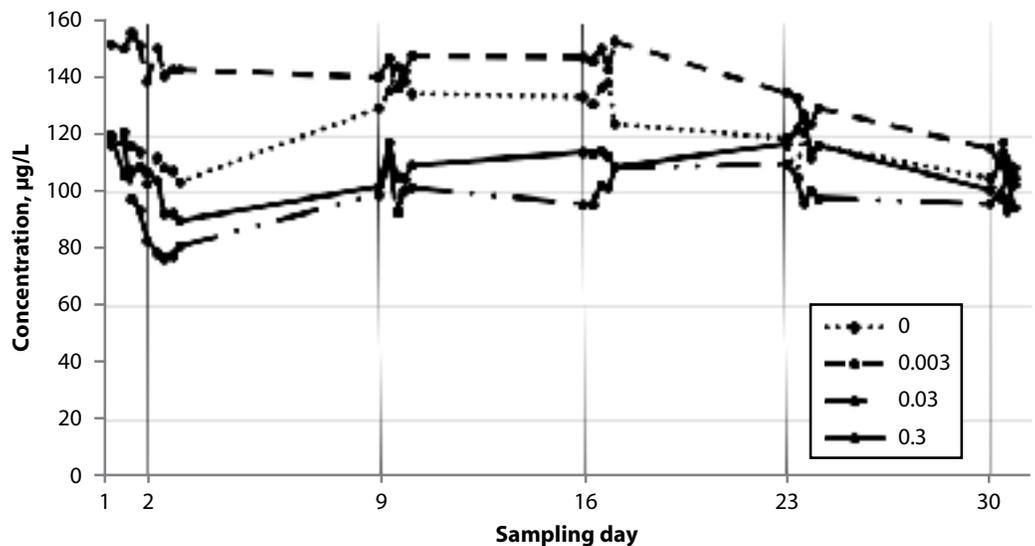
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# Menthol Supplementation Has Minimal Effects on Blood Components from Holstein Steers

*Cadra Van Bibber-Krueger*

**Objective:** Evaluate changes in blood components associated with growth when menthol was incorporated into the diets of steers.

**Study Description:** Holstein steers (n = 52, body weight 1,262 lb) were sorted by body weight and assigned to treatments. Treatments consisted of 0, 0.003, 0.03, or 0.3% of diet dry matter as crystalline menthol, which was incorporated into the diet starting on day 2. Blood samples were obtained on days 1, 2, 9, 16, 23, and 30 at 0, 6, 12, 18, and 24 hours after feeding. Plasma was analyzed for metabolites of menthol, and serum was analyzed for insulin-like growth factor-1 concentrations.



**The Bottom Line:** Addition of menthol to diets of cattle had no impact on insulin-like growth factor or growth performance parameters measured in this trial.



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# Effects of Growth-Promoting Technologies on Feedlot Performance and Carcass Characteristics of Crossbred Heifers

Sara M. Ebarb

**Objective:** Determine the effects of two growth-promoting programs on feedlot heifer performance and carcass characteristics.

**Study Description:** Two groups of crossbred heifers ( $n = 33$  and  $32$ ) were subjected to exogenous growth-promoting technologies. Treatments consisted of: control (no implant or Optaflexx [Elanco Animal Health, Greenfield, IN]); implant (Component TE-200 [Elanco Animal Health] on day 0 and no Optaflexx); Optaflexx/implant (Component TE-200 on day 0 and Optaflexx supplementation at 400 mg per head for the final 28 days for group 1 and 29 days for group 2). After the feedlot phase, cattle were shipped to a commercial abattoir and carcass characteristics were recorded.

### Feedlot performance and carcass characteristics for heifers subjected to exogenous growth promoting technologies

| Item                   | Control            | Implant <sup>1</sup> | Optaflexx/<br>Implant <sup>2</sup> | SEM <sup>3</sup> | P-value |
|------------------------|--------------------|----------------------|------------------------------------|------------------|---------|
| Average daily gain, lb | 3.26               | 3.56                 | 3.87                               | 0.23             | 0.18    |
| Dry matter intake, lb  | 20.4               | 20.2                 | 19.8                               | 0.7              | 0.83    |
| Hot carcass weight, lb | 719.7              | 749.4                | 752.2                              | 11.4             | 0.09    |
| Ribeye area, sq. in.   | 13.05 <sup>a</sup> | 14.13 <sup>b</sup>   | 14.35 <sup>b</sup>                 | 0.25             | <0.01   |
| Strip loin weight, lb  | 12.35 <sup>a</sup> | 13.71 <sup>b</sup>   | 13.44 <sup>b</sup>                 | 0.22             | <0.01   |

<sup>1</sup> Heifers within this treatment group received a Component TE-200 implant (Elanco Animal Health, Greenfield, IN) on d 0 of study.

<sup>2</sup> Heifers within this treatment group received a Component TE-200 implant on d 0 of study and 400 mg/day per head of Optaflexx (Elanco Animal Health).

<sup>3</sup> SEM = standard error of the mean.

<sup>a,b</sup> Means within a row with a different superscript are different ( $P < 0.05$ ).

**The Bottom Line:** Animals subjected to growth-promoting technologies utilized similar amounts of feed yet produced greater amounts of lean muscle tissue, as shown through improvements in strip loin weights and ribeye area.



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## Effects of Growth-Promoting Technologies on Muscle Characteristics and Meat Tenderness

Sara M. Ebarb

**Objective:** Examine the effects of growth-promoting technologies and extended aging on structural muscle characteristics and meat tenderness.

**Study Description:** Two groups of crossbred heifers ( $n = 33$  and  $32$ ) were subjected to exogenous growth-promoting technologies. After the feedlot phase, cattle were shipped to a commercial abattoir for harvest; following a 48-hour chill, boneless strip loins were collected. Upon arrival at Kansas State University, the loin was faced, and this steak was used for analysis of muscle fiber characteristics. The loin was further fabricated into steaks for measurements of Warner-Bratzler shear force and collagen solubility and aged to one of five postmortem aging periods (2, 7, 14, 21, or 35 days) in vacuum-packaged bags at 33°F.

### Tenderness measurements and muscle characteristics of strip loin steaks

| Item                                | Control              | Implant <sup>1</sup> | Optaflexx/<br>Implant <sup>2</sup> | SEM <sup>3</sup> | <i>P</i> -value |
|-------------------------------------|----------------------|----------------------|------------------------------------|------------------|-----------------|
| Warner-Bratzler shear force, lb     | 8.3 <sup>a,x</sup>   | 9.2 <sup>a,b,y</sup> | 10.1 <sup>b</sup>                  | 0.4              | <0.01           |
| Cross-sectional area, $\mu\text{m}$ |                      |                      |                                    |                  |                 |
| Type I                              | 2,082.9              | 2,278.5              | 2,292.6                            | 75.9             | 0.10            |
| Type IIA                            | 3,003.7 <sup>a</sup> | 3,540.9 <sup>b</sup> | 3,485.8 <sup>b</sup>               | 127.9            | <0.01           |
| Type IIX                            | 3,750.2              | 4,192.9              | 4,164.1                            | 161.2            | 0.10            |
| Soluble collagen, %                 | 12.1                 | 12.2                 | 11.9                               | 0.4              | 0.90            |
| Insoluble collagen, %               | 87.9                 | 87.8                 | 88.0                               | 0.4              | 0.90            |

<sup>1</sup> Animals within this treatment group received a Component TE-200 (Elanco Animal Health, Greenfield, IN) on day 0 of study.

<sup>2</sup> Heifers within this treatment group received a Component TE-200 (Elanco Animal Health) implant on day 0 and 400 mg/head per day of ractopamine hydrochloride (Optaflexx, Elanco Animal Health).

<sup>3</sup> SEM = standard error of the mean.

<sup>a,b</sup> Means within a row with a different superscript are different ( $P < 0.05$ ).

<sup>x,y</sup> Means within a row with a different superscript tend to differ ( $P < 0.10$ ).

**The Bottom Line:** The addition of growth-promoting technologies decreased tenderness, which was potentially due to increases in muscle fiber cross-sectional area stimulated by growth promotants, because these technologies had no effect on collagen solubility. Use of an extended postmortem aging program improved tenderness for all steaks, which was partly owing to increases in collagen solubility.



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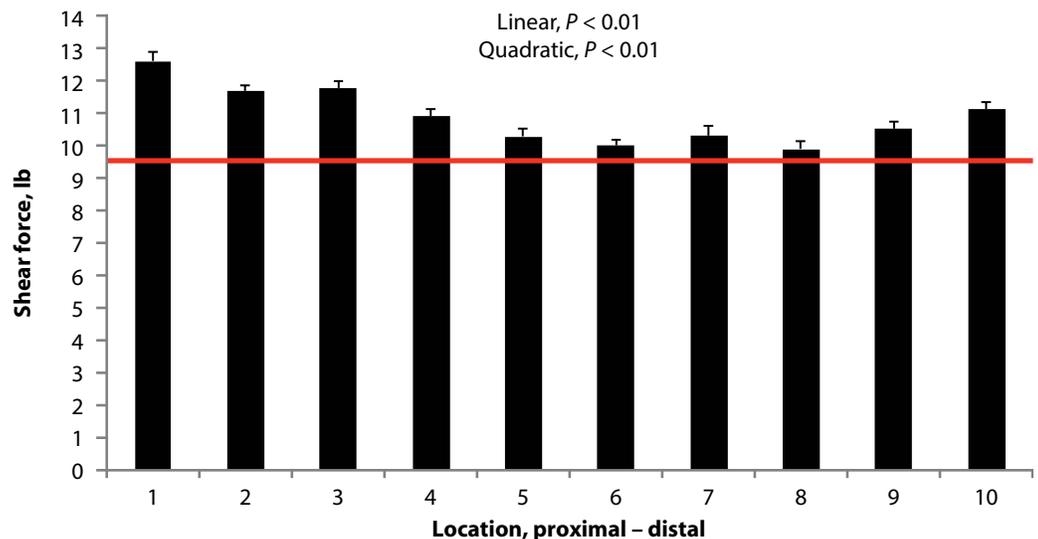
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# Effects of Postmortem Aging Time and Muscle Location on Objective Measures of *Semitendinosus* Steak Tenderness

Mauricia Silva

**Objectives:** Evaluate the effects of aging and anatomical location on the tenderness of *Semitendinosus* steaks collected from steers fed two levels of zinc and two levels of Optaflexx (Elanco Animal Health, Greenfield, IN).

**Study Description:** The *Semitendinosus* was collected after harvest from 60 cross-bred steers fed for 28 days to test two levels of zinc supplementation and two levels of Optaflexx supplementation. Steaks were fabricated from each sample and assigned to 7, 14, 21, or 42 days of aging. Following each aging time, objective tenderness measurements were collected. Warner-Bratzler shear force of steaks originating from 10 different locations within the *Semitendinosus* (eye of round) were measured. Steaks were cut from the proximal (steak 1) to distal (steak 10) end of the muscle, aged for 7, 14, 21, and 42 days, and cooked to 160°F. Data presented represent the average shear values of steaks aged over all four periods. The solid horizontal line indicates the threshold value of Warner-Bratzler shear that is considered “tender” for consumers.



**The Bottom Line:** Steaks from the proximal and distal ends of the *Semitendinosus* are tougher than steaks from the middle locations of the muscle.



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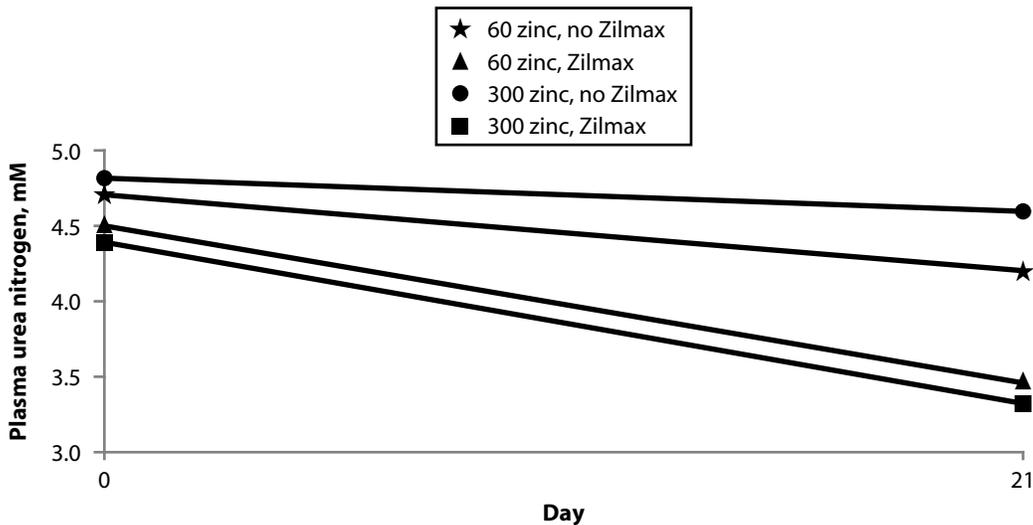
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## Supplemental Zinc Oxide Does Not Interact With Zilmax in Feedlot Steers

*Cadra Van Bibber-Krueger*

**Objectives:** Evaluate interactive effects of supplemental zinc and Zilmax on feedlot performance, blood components, and carcass traits of finishing steers.

**Study Description:** Steers (n = 40; initial body weight 1,437 lb) were sorted by body weight and assigned to treatments. Treatments consisted of 60 or 300 ppm added zinc, with 0 or 7.56 g/ton zilpaterol hydrochloride (Zilmax; Merck Animal Health, Summit, NJ). Steers were housed individually. Zilmax was fed for 22 days then removed 3 days prior to harvest. Plasma samples were collected on days 0 and 21 to assess urea nitrogen, glucose, and lactate concentrations. Steers were weighed on days 0, 21, and prior to shipment on day 25. Carcass data were collected after slaughter.



**The Bottom Line:** Increasing dietary concentrations of zinc does not affect response to Zilmax, but feeding Zilmax alters the circulating concentrations of blood components associated with muscle growth.



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## Hops Beta-Acid Extract Yields Feedlot Performance Similar to Rumensin

*Justin Axman*

**Objective:** Assess the effects of  $\beta$ -acid extracts of hops on feedlot performance in finishing cattle fed high-concentrate diets and determine a response to varied doses of  $\beta$ -acid extracts of hops.

**Study Description:** Eighty heifers (855 lb) were sorted by body weight, randomly allotted to individual pens, and fed a finishing diet that included no feed additive, Rumensin (Elanco Animal Health, Greenfield, IN), or 10, 25, or 50 ppm of hops  $\beta$ -acid extract. Cattle were weighed on day 23 and subsequently in 21-day intervals. Cattle were harvested on day 147 of the finishing trial. Ruminal fluid was collected via rumenocentesis on days 44 and 86 to analyze ruminal volatile fatty acid and ammonia concentrations.

#### Live performance

| Item                      | Treatments |         |         |         |          | SEM   | P-value |
|---------------------------|------------|---------|---------|---------|----------|-------|---------|
|                           | Control    | Beta 10 | Beta 25 | Beta 50 | Rumensin |       |         |
| Number                    | 16         | 15      | 16      | 16      | 16       |       |         |
| Days on feed              | 147        | 147     | 147     | 147     | 147      |       |         |
| Initial weight, lb        | 861.1      | 854.9   | 856.0   | 852.9   | 850.1    |       |         |
| Final weight, lb          | 1,311.0    | 1,324.0 | 1,316.0 | 1,324.0 | 1,305.0  |       |         |
| Average daily gain, lb    | 3.04       | 3.06    | 3.19    | 3.08    | 3.19     | 0.11  | 0.78    |
| Dry matter intake, lb/day | 21.78      | 21.80   | 21.76   | 21.96   | 21.87    | 0.38  | 0.97    |
| Feed:gain                 | 7.17       | 7.12    | 6.83    | 7.17    | 6.86     | 0.005 | 0.72    |

**The Bottom Line:** Hops  $\beta$ -acid extract yielded results similar to Rumensin and may be a suitable alternative for use in branded beef programs that do not permit use of ionophores.



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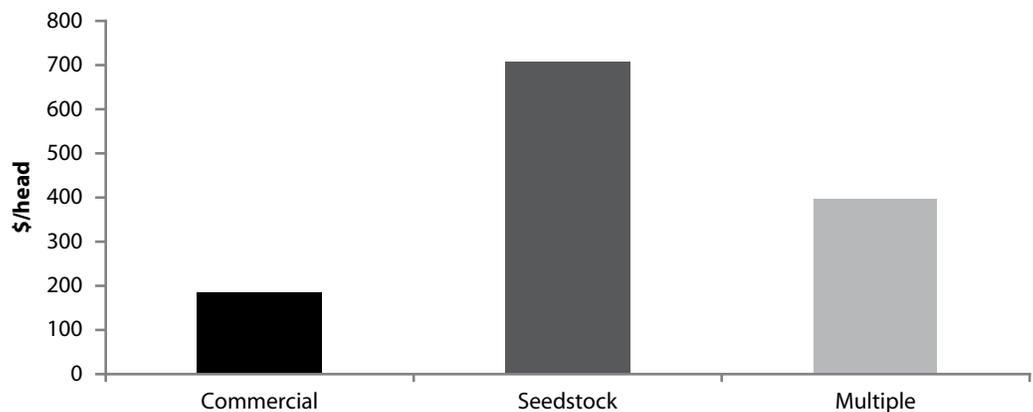
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## Artificial Insemination Valuable to Commercial and Seedstock Producers

*Sandy Johnson*

**Objective:** Determine how and the extent to which artificial insemination and estrus synchronization contribute to profitability.

**Study Description:** Artificial insemination and estrous synchronization remain underutilized by U.S. beef producers. The most recent National Animal Health Monitoring Survey (NAHMS 2007–08) reported that 7.6% of producers used artificial insemination and 7.9% used estrous synchronization. The most common reason cited for not using various reproductive technologies was time and labor, followed by cost and difficulty. An online survey was completed by 425 producers who assessed various management practices, ways that artificial insemination contributed to profitability, and the value of calves sired by artificial insemination. Logistic regression was used to determine differences in practices based on involvement in the industry (commercial cow-calf, seedstock, commercial heifer development, veterinarian, artificial insemination technician, other).



**Increased value of calves sired by artificial insemination compared with natural service-sired calves**

**The Bottom Line:** Both commercial and seedstock producers realized greater value from calves sired by artificial insemination compared with calves sired by natural service. Average value was higher for seedstock (\$709/head) producers than for commercial producers (\$187/head), although marketing endpoints may differ.



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## Performance of Beef Replacement Heifers Supplemented With Dried Distillers Grains Versus a Mixture of Soybean Meal and Finely Ground Sorghum Grain

*Carson McMullen*

**Objective:** Determine if dried distillers grains with solubles (DDGS) is a viable replacement for an oilseed meal-based protein supplement for developing heifers on low-quality dormant-native range.

**Study Description:** Angus-Hereford cross heifers (n = 88; 583 lb) were supplemented daily while on dormant native-range pastures (4.4% crude protein). Treatments consisted of daily supplementation of either 3.64 lb DDGS (1.25 lb crude protein, dry matter basis) or 3.03 lb of a 73.6% soybean meal and 26.4% rolled sorghum grain mixture (SBM-M; 1.24 lb crude protein, dry matter basis). Treatments were administered from January 15 through April 8.

| Item                                     | Supplement |       | SEM  | P-value |
|--|------------|-------|------|---------|
|  | DDGS       | SBM-M |      |         |
| Body weight change, lb                   | 101.5      | 109.4 | 3.58 | 0.17    |
| Body condition score change <sup>1</sup> | 0.78       | 0.84  | 0.06 | 0.53    |

<sup>1</sup> Scale = 1 to 9: 1 = extremely emaciated, 9 = extremely obese.

**The Bottom Line:** DDGS can replace a mixture of soybean meal and ground sorghum when supplemented daily and fed on an equal crude protein basis without adversely affecting performance of replacement heifers grazing low-quality dormant native range.



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# Genetic Improvement Made Through DNA Testing and Artificial Insemination to High Growth, High Carcass Value Angus Sires

Lindsey C. Grimes

**Objective:** Demonstrate the potential for improving marbling and grid premium potential in a cow base with average to below-average genetic potential in just one generation through the use of genomics and artificial insemination.

**Study Description:** In April 2012, 104 yearling heifers, predominantly Charolais and Charolais crosses, were obtained from a single ranch source in Texas. Heifers were expected to have low genetic potential for marbling. Heifers were DNA-tested to predict marbling potential, and all heifers had below-average GeneSTAR DNA marker-predicted marbling values. Heifers in the bottom third for marbling potential were culled. Retained females were bred by artificial insemination to one of two Angus sires known for high growth potential and increased carcass quality. Resulting calves were managed traditionally, DNA-tested, fed in a southwest Kansas feedyard, and harvested in June 2014.

### Calves exhibited improved marbling scores, hot carcass weights, yield grades, and economic returns compared with dams

| Item                             | Dams       | Progeny    | SEM   | P-value |
|----------------------------------|------------|------------|-------|---------|
| Marbling score                   | 414        | 532        | 13.0  | <0.01   |
| Hot carcass weight, lb           | 820.5      | 823.2      | 29.9  | <0.01   |
| 12th-rib fat, in.                | 0.32       | 0.54       | 0.02  | <0.01   |
| Ribeye area, sq. in.             | 14.7       | 12.9       | 0.21  | <0.01   |
| Kidney, pelvic, and heart fat, % | 2.5        | 2.5        | 0.00  | >0.05   |
| Yield grade                      | 1.66       | 2.91       | 0.12  | <0.01   |
| Price/animal                     | \$1,482.11 | \$1,948.81 | 31.72 | <0.01   |
| Price/100 lb                     | \$181.08   | \$237.27   | 2.18  | <0.01   |

**The Bottom Line:** Genomic testing and artificial insemination can yield a significant improvement in carcass quality of progeny and result in increased financial returns for producers in just one generation.



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## Heat Detection Patches Differ in Length of Retention

*Sandy Johnson*

**Objective:** Compare the efficacy of Estroprotect (Rockway, Inc.; Spring Valley, WS) and Standing Heat (Standing Heat, LLC; Danneborg, NE) heat-detection patches during synchronized estrus.

**Study Description:** Angus and Angus cross yearling heifers at two locations ( $n = 118$ , location 1;  $n = 87$ , location 2) had estrus synchronized for fixed-time artificial insemination. At the time prostaglandin was administered, each heifer received one Estroprotect and one Standing Heat patch, alternating the patch with the forward placement on every other heifer. At the time of insemination, patches were scored as 0 = unchanged, 1 = color change on less than half of the surface, 2 = color change on more than half of the surface, and 3 = patch missing.

**Results:** At the time of AI, more ( $P < 0.01$ ) Standing Heat devices were missing than Estroprotect, 60 (29%) vs. 6 (3%), respectively. Retention of patches was higher ( $P < 0.01$ ) at location 1 (74%) than location 2 (60%). When missing patches were assumed to indicate heifers had shown heat, agreement between the two devices was considered good.

|                                   | Estroprotect status                 |                            |
|-----------------------------------|-------------------------------------|----------------------------|
|                                   | In heat (score <sup>1</sup> 2 or 3) | Not in heat (score 0 or 1) |
| Test positive                     | 103 (true positive)                 | 10 (false positive)        |
| Test negative                     | 22 (false negative)                 | 71 (true negative)         |
| Sensitivity (95% CI) <sup>2</sup> | 82.4 (74.6-88.6)                    |                            |
| Specificity (95% CI)*             |                                     | 87.7 (78.5-93.9)           |

<sup>1</sup> At the time of insemination, patches were scored as 0 = unchanged, 1 = color change on less than half of the surface, 2 = color change on more than half of the surface, and 3 = patch missing.

<sup>2</sup> 95% confidence interval.

**The Bottom Line:** Length of retention of Estroprotect patches was longer than Standing Heat patches under the conditions of this study. When missing patches are assumed to indicate heifers had shown heat, agreement between the two systems was good.



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## Genetic Variance and Covariance Components for Feed Intake, Average Daily Gain, and Postweaning Gain in Growing Beef Cattle

*Kelli Retallick*

**Objective:** Obtain estimates of genetic parameters for growth and intake traits to quantify the relationship between performance test average daily gain and National Cattle Evaluation postweaning gain.

**Study Description:** On-test average daily feed intake (ADFI), on-test average daily gain (ADG), and postweaning gain (PWG) records on 5,606 growing steers and heifers were obtained from the U.S. Meat Animal Research Center in Clay Center, NE. Feed efficiency contemporary groups were defined as birth location, season, on-test date, and feeding management code. The PWG contemporary groups were defined as birth location, season, weaning date, and yearling weight date. The three-generation pedigree contained 9,211 animals from 27 different breed groups. On-test ADFI and ADG data were collected from a minimum of 62 to 148 testing days. Independent quadratic regressions were fitted for body weight on time, and on-test ADG was predicted from the resulting equations. PWG was calculated by subtracting 205-day weights from 365-day weights and dividing by 160 days. Heritability estimates and genetic/residual correlations were estimated using multiple-trait animal mixed models with ADG, ADFI, and PWG for both sexes as dependent variables.

**Results:** Heritability estimates for ADG, ADFI, and PWG of steers were 0.09, 0.43, and 0.36, respectively, and corresponding estimates for heifers were ADG 0.14, ADFI 0.39, and PWG 0.42. These estimates confirm that genetic improvement of feed efficiency can be made. The genetic correlations between steer ADG and ADFI, PWG and ADFI, and ADG and PWG were 0.73, 0.58, and 0.81, respectively, and corresponding estimates for heifers were 0.64, 0.77, and 0.65. The genetic correlations among traits for steers and heifers were strong.

**The Bottom Line:** Strong correlations between ADG and PWG for both sexes indicated that PWG is a strong proxy for ADG on-test and that using long test periods to accurately measure ADG may be unnecessary, which would allow more animals to be tested per year with a given set of facilities. Testing more animals per facility leads to decreased testing costs and increased rate of genetic change for feed efficiency.



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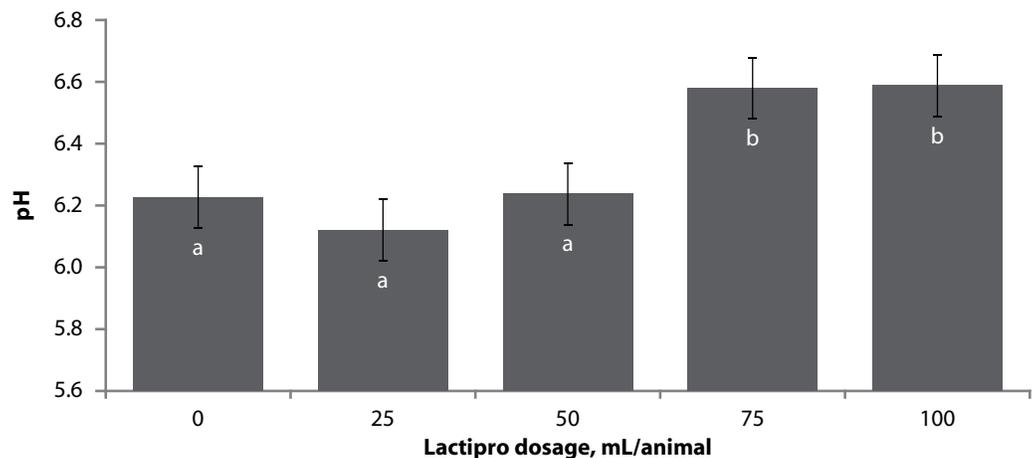
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## Lactipro (*Megasphaera elsdenii*) Increases Ruminal pH and Alters Volatile Fatty Acids During Transition to an 80% Concentrate Diet

Jake Thieszen

**Objective:** Evaluate changes in ruminal pH and ruminal concentrations of organic acids during transition to a diet containing 80% concentrate after orally administering 0, 25, 50, 75, or 100 mL of *Megasphaera elsdenii* culture (Lactipro; MS-Biotec, Wamego, KS).

**Study Description:** Crossbred heifers (n = 240, body weight 1,100 lb) were sorted by weight and assigned to one of five treatments. Treatments consisted of oral dosages of 0, 25, 50, 75, and 100 mL of Lactipro administered orally before transition to an 80% concentrate diet. Intakes were measured and ruminal samples were collected at 5, 10, 15, 20, 25, and 30 hours after dosing. Ruminal samples were measured for pH, volatile fatty acid, and lactic acid concentration.



### pH of ruminal fluid 25 hours after diet transition.

<sup>a,b,c</sup> Columns without a common letter differ ( $P < 0.05$ ).

**The Bottom Line:** Dosing heifers with Lactipro (*Megasphaera elsdenii*) increased pH, altered volatile fatty acid concentrations, and improved feed efficiency.



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# Evaluation of the Productivity of a Single Subcutaneous Injection of LongRange in Stocker Calves Compared With a Positive (Dectomax) and a Negative (Saline) Control

Angela Vesco

**Objective:** Compare efficacy of LongRange (Merial, Duluth, GA) and Dectomax (Zoetis; Florham Park, NJ) injectables and saline (a negative control) for control of parasites in stocker cattle.

**Study Description:** Stocker cattle are commonly affected by subclinical parasitism. Single-dose anthelmintics have been shown to reduce internal worm load for approximately 30 days. LongRange is the first single-dose extended-release anthelmintic, providing parasite control for a minimum of 100 days. Crossbred heifers ( $n = 288$ ;  $254.47 \text{ lb} \pm 29.40$ ) were completely randomized by initial weight across 15 pastures. Pastures were randomly assigned to either: (1) LongRange administered at 1 mL/50kg; (2) Dectomax administered at 1 mL/50 kg with Cyonara Plus insecticide given at 10 mL/272.16kg; or (3) saline administered at 1mL/45.4 kg, with five pastures per treatment. Individual heifers were weighed, and fecal samples were taken from five randomly selected heifers per pasture. Body weights and fecal samples were taken on days 0, 47, and 96. Fly counts began on day 50 and continued on a weekly basis until end of trial. Three heifers were randomly selected per pasture, and pictures were taken of each heifer using a digital camera with a telephoto zoom lens. Pictures were uploaded to a computer program where flies were highlighted and counted by hand.

### Fly repellent response to anthelmintic treatment in grazing heifers

| Fly counts <sup>1</sup> | Treatment         |                    |                    | SEM  | P-value |
|-------------------------|-------------------|--------------------|--------------------|------|---------|
|                         | LongRange         | Dectomax           | Saline             |      |         |
| Mean                    | 79.2 <sup>a</sup> | 106.6 <sup>b</sup> | 109.1 <sup>c</sup> | 9.39 | 0.04    |

<sup>1</sup> Individual fly counts per heifer on one side.

<sup>a,b,c</sup> Within a row, least squares means without a common superscript differ ( $P \leq 0.05$ ).

Weight gains were similar between treatments ( $P \geq 0.27$ ) throughout the 96-day study. Fecal egg counts were similar among treatments on days 0 and 47 ( $P > 0.3$ ); however, on final collection, Dectomax had lower ( $P = 0.05$ ) egg counts compared with the control group ( $P < 0.05$ ), and cattle from the LongRange treatment were intermediate and not different from other treatments ( $P > 0.05$ ).

**The Bottom Line:** LongRange can be used for season-long protection against internal and external parasites in grazing heifers.



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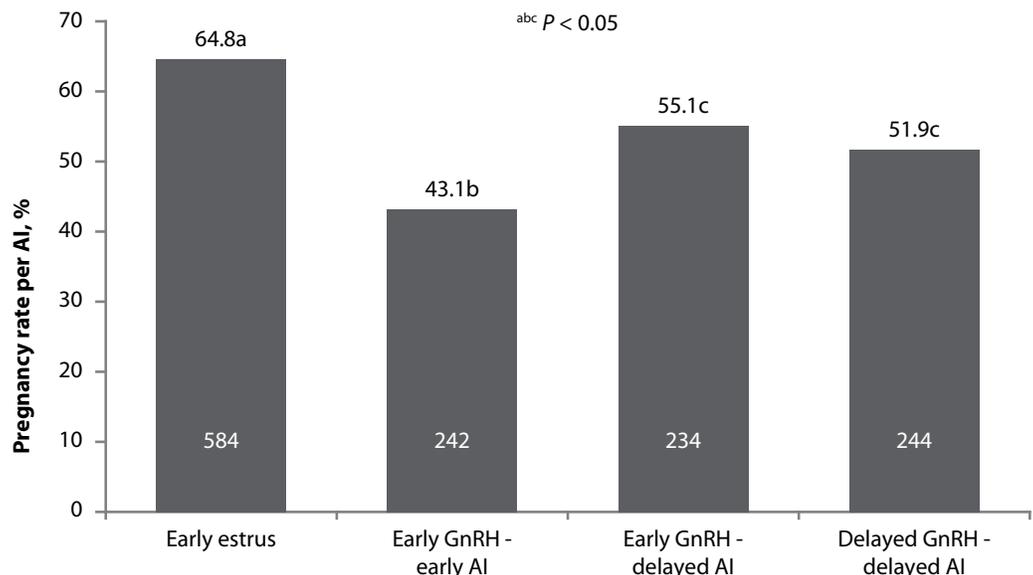
# Using Estrus-Detection Patches to Vary Time of Insemination Improves Pregnancy Rates Compared With One Single Timed Insemination

Scott Hill

**Objective:** Examine whether delaying insemination from 60 to 75 hours after the CO-Synch + CIDR (controlled internal drug release) synchronization program would improve pregnancy rates of suckled beef cows.

**Study Description:** A total of 1,311 beef cows were studied. Cycling status and body condition scores were determined before the start of a standard 7 day CO-Synch + CIDR program. Cows in estrus by 60 hours after CIDR removal as determined by estrus-detection patches were inseminated and injected with gonadotropin-releasing hormone (GnRH). Remaining cows were allocated to 3 treatments at 60 hours: artificial insemination (AI) and GnRH injection at 60 hours, GnRH injection at 60 hours with AI at 75 hours, or AI and GnRH injection at 75 hours.

**Results:** More cows ( $P < 0.001$ ) that showed estrus conceived to AI (67.5 vs 43.1%) than cows not showing estrus. Early estrus cows inseminated at 60 hours had a greater ( $P < 0.05$ ) pregnancy rate to AI compared with treatments. Cows that did not display estrus by 60 hours had a greater ( $P < 0.001$ ) pregnancy rate per AI when they were inseminated at 75 than at 60 hours (69.8 vs 41.3%). Pregnancy rate was greater ( $P < 0.001$ ) in cows that calved more than 79 days before AI (56.8 vs. 47.8%) compared with later-calving cows (<79 days from calving) to AI.



**The Bottom Line:** Delaying insemination to 75 hours in cows that have not demonstrated estrus by 60 hours after CIDR removal improved pregnancy rates to timed AI.



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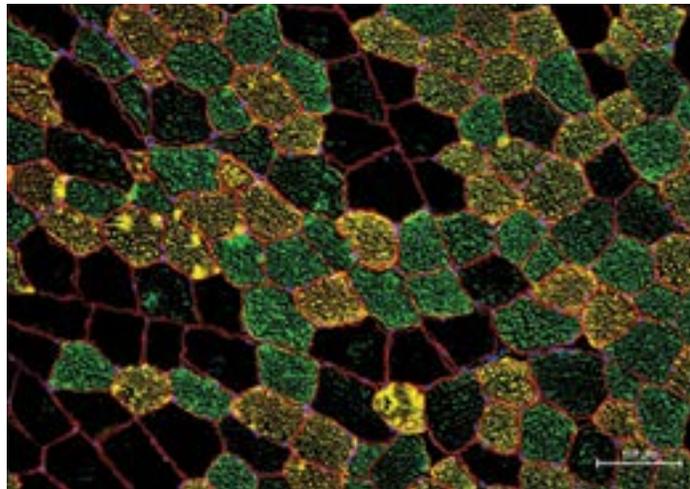
### SUMMARY PUBLICATION

This summary publication is intended for distribution at Cattlemen's Day 2015. Full reports are available at <http://newprairiepress.org/kaesrr>

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**Cover photo:** Beef *Longissimus lumborum* muscle (strip steak) immunohistochemically stained to identify different muscle fiber types. Yellow identifies type 1 fibers, green identifies type 2A fibers, and fibers with no color are type 2X fibers. The red border is used to measure the size of each fiber. Increases in the size of individual muscle fibers are responsible for increases in muscle size, but increased muscle fiber size also is associated with a decrease in cooked meat tenderness.

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March 2015