K-STATE Research and Extension

# Beef Tips

March 2015 Department of Animal Sciences & Industry www.asi.ksu.edu/beeftips

## Upcoming Events

**Cattlemen's Day**
March 6, 2015
Manhattan, KS
www.KSUBeef.org

**Roundup**
April 16, 2015
Hays, KS
www.wkarc.org

**BBQ 101**
May - June, 2015
Multiple locations
details at www.KSUBeef.org

**Beef Improvement Federation Annual Convention**
June 9 - 12, 2015
Biloxi, Mississippi
http://beefimprovement.org

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## Preparation key for successful bull purchases

*Bob Weaber, cow-calf specialist*

As the bull-buying season gets underway, commercial cattlemen should do their home work to help ensure the bull(s) they purchase this year meet their needs. Preparedness is the key to making an informed purchase. Before you crack open the sale catalogs of seedstock suppliers, there are few resources and skills you should possess.

First, make sure you understand the use of Expected Progeny Differences (**EPD**) and selection indexes. While EPDs are not the only selection information you should consider, EPDs are the most effective tools available to describe the genetic differences between animals within and across herds. EPDs are much more effective genetic predictors than actual or adjusted performance records. If an EPD is available for a trait it should be used instead of an animal's own performance record for that trait. The EPD removes age and environmental effects that can bias a decision based on actual or adjusted performance records. Use Calving Ease (CE or CED) EPD, rather than birth weight (BW) EPD, if it's available, to select bulls that minimize calving difficulty. CE EPD calculations include BW data and other sources of information that affect dystocia.

Not all EPDs are the same, so make sure you know the appropriate information for the breed of cattle you are purchasing. A useful reference on EPDs and other genetic topics is the Beef Sire Selection Manual (http://www.nbcec.org/producers/sire.html). Obtain the breed average EPDs and a percentile rank table available from the most current genetic evaluation for the breed of interest. Percentile rank tables can be found on most breed association websites. These tools will enable you to compare the relative genetic merit of individual animals to other animals in the breed.

Second, make sure you know what traits you would like to improve in your herd. What breed(s) fit in your mating system? If you are using a crossbreeding system make sure the breed you selected fits your objectives. Other factors to consider are: keeping replacement heifers, endpoints for progeny marketing (wean-ing, backgrounded or in the beef). Assessment of these factors will help point you to the best breed for your needs and the combinations of maternal/growth/carcass traits that best fit your operation and environment. Be sure to apply selection to traits that have direct economic importance in your production system.

Third, set a realistic budget for bull purchases. Like most things in life, price is driven by quality. Evaluation of a seedstock supplier's prior year sale averages will give you an idea of what to expect in terms of purchase costs. That said, prices over the last 12 months indicate that seedstock purchases are substantially more expensive, some as much as $500 to $1,000 more, than in previous years. A good rule of thumb is that a quality seedstock bull costs roughly the same as the value of 4-5 feeder steers in the current market. A number of reputation seedstock bull sales have averaged $6-8,000 this past fall. The added purchase cost makes it even more important to make a well thought out decision.

Fourth, get to know your seedstock supplier and make sure he/she knows you and your operational goals. Seek out recommendations from your supplier well in advance of the sale. Once you receive the sale catalog make a short list of bulls (6-12 head) that fit your specifications. Arrive at the sale site early to inspect the bulls on your short list. Shorten this list of

*continued...see **Bulls** on page 5*

*"You can't manage what you don't measure."*

## *Tally Time – Tips for a Successful Synchronization and AI Program*

*Sandy Johnson, livestock specialist*

The foundation for reproduction is a sound year round nutrition program that includes animals being in a positive energy balance (more energy coming in than being expended) before the breeding season and during early embryonic development. Subclinical trace mineral deficiencies can result in reduced conception rates but adding more of the same or a different source of a trace mineral above requirement may or may not increase level of reproduction. Partner with your veterinarian to develop a sound animal health and biosecurity program to minimize drags to reproductive response. Presence of even one animal persistently infected with BVD will reduce herd fertility.

A herd that typically achieves 85% or greater pregnancy rate in a 60 day breeding season makes a good candidate for an artificial insemination and estrous synchronization program. The following checklist should draw attention to the details that make these programs more successful.

- Responses will be highest in cows that are 45 days from calving or greater at the time of AI and in a body condition score of 5 or greater.
- Use a synchronization system with a CIDR or MGA if you suspect some females are not cycling.
- Moving a later calving cow to an earlier calving date generates roughly 40 lbs more calf per cycle advanced. Consider use of more economical semen on these females that are in good condition and at least 30 days since calving at AI.
- Select from the short list of recommended synchronization protocols (www.beefrepro.info) published in major sire catalogs.
- Follow the protocol as outlined. Pay particular attention to the recommended intervals between the last injection of prostaglandin and timed AI.
- Use the Estrus Synchronization Planner (http://www.iowabeefcenter.org/estrus_synch.html ) or www.estrussynch.com for mobile devices to plan and schedule your synchronization program. Double check the necessary help is available on the scheduled dates.
- Only synchronize as many animals as you can inseminate in your facilities in a 3 to 4 hour time window.
- For timed-AI, don't overestimate your ability to inseminate a large number of females. Have a back-up plan or more help available.
- Double check you have the necessary doses of synchronization products on hand. Give the correct product on the correct day and at the proper dosage via the correct route. These items are easy to confuse when you only use them once per year.
- Make sure each animal receives the treatment, accuracy is more important than speed. Use 1.5" 18 gauge needles to give intramuscular injections. Follow BQA guidelines.
- Before the season starts, check the accuracy of an automatic thaw unit and monitor while in use. Clean thaw unit on a regular basis.
- Use thawing instructions from semen provider; generally in the range of 90-98° F for 30 to 45 seconds. Use a watch or timer, do not guess.
- Clean and inventory supplies in AI kit; ensure an adequate supply of gloves, sheaths, lube and paper towels.
- Handling facilities should be in good working condition to minimize stress on animals and people.
- Replace missing or unreadable ear tags.
- Use a Certified Semen Services (CSS) provider. A check of semen quality prior to freezing is not part of the routine processing done in smaller collection facilities.
- Keep accurate inventory records of the semen tank(s).
- Canisters should not be raised above the frost line in the neck of the tank for more than 5-8 seconds. Thermal injury is permanent. Increased handling increases the risk of damage.
- Thaw no more semen than can be used in 10 minutes or less. Prevent straw to straw contact when thawing.
- If breeding on heat keep detailed records at each check. Inseminate 4 to 12 hours after first observed standing heat.
- Keep natural service sires out of breeding pasture until 10-14 days after AI if you want to identify AI-sired calves without DNA parentage testing.
- Avoid stressors such as those caused by transportation, nutritional changes or ambient temperature/humidity strain during early embryonic development. Most sensitive from day 5 to 18 (embryo arrival in uterus through maternal recognition of pregnancy) and still sensitive until attachment is complete at day 42.

For more information see the publication Tips for a Successful Synchronization Program at http://www.ksre.k-state.edu/bookstore/pubs/mf2574.pdf .

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

*L C. Grimes, L. R. Corah, T. Brink, M. R. Gardiner, and A. K. Sexten*

**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 | P-value |
|---|---|---|---|
| Marbling score | 414 | 532 | <0.01 |
| Hot carcass weight, lb | 820.5 | 823.2 | <0.01 |
| 12th-rib fat, in. | 0.32 | 0.54 | <0.01 |
| Ribeye area, sq. in. | 14.7 | 12.9 | <0.01 |
| Kidney, pelvic, | 2.5 | 2.5 | <0.05 |
| Yield grade | 1.66 | 2.91 | <0.01 |
| Price/animal | $1,482.11 | $1,948.81 | <0.01 |
| Price/100 lb | $181.08 | $237.27 | <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.

**Can An Injectable Trace Mineral Product Improve Reproductive Parameters in Developing Yearling Beef Bulls?**

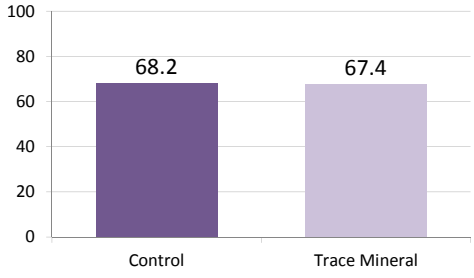
*A. A. Kirchhoff, K. E. Fike, and R. Breiner*

**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 intravenously 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 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:** 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 (BSE) 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.

***Additional Cattlemen's Day Research summaries and full length reports can be found at http://newprairiepress.org/kaesrr/***

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

*S. M. Ebarb, K. J. Phelps, J. E. Axman, C. L. Van Bibber, J. S. Drouillard, and J. M. Gonzalez*

**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**

| Item | Control | Implant[1] | Optaflexx/ Implant[2] |
|---|---|---|---|
| Average daily gain, lb | 3.26 | 3.56 | 3.87 |
| Dry matter intake, lb | 20.4 | 20.2 | 19.8 |
| Hot carcass weight, lb | 719.7 | 749.4 | 752.2 |
| Ribeye area, sq. in. | 13.05[a] | 14.13[b] | 14.35[b] |
| Strip loin weight, lb | 12.35[a] | 13.71[b] | 13.44[b] |

[1] Heifers within this treatment group received a Component TE-200 implant (Elanco Animal Health, Greenfield, IN) on d 0 of study.
[2] 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).
[a,b] 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.

**Hops B-Acid Extract Yields Feedlot Performance Similar to Rumensin**

*J. E. Axman, C. L. Van Bibber, C. Alvarado, J. Thieszen, and J. S. Drouillard*

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

| | Treatments | | | | |
|---|---|---|---|---|---|
| Item | 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 | 852.9 | 850.1 |
| Final weight, lb | 1,311 | 1,324 | 1,316 | 1,324 | 1,305 |
| Average daily gain, lb | 3.04 | 3.06 | 3.19 | 3.08 | 3.19 |
| Dry matter intake, lb/day | 21.78 | 21.8 | 21.76 | 21.96 | 21.87 |
| Feed:gain | 7.17 | 7.12 | 6.83 | 7.17 | 6.86 |

**The Bottom Line:** Hops β-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.

## *2015 Cattlemen's Day Summaries*

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

*T. Spore, S. Montgomery, C. Vahl, B. E. Oleen, W. R. Hollenbeck, J. W. Waggoner, J. Hill, and D. A. Blasi*

**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.

**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.

### Kansas Agricultural Experiment Station unveils new platform for publishing research reports

K-State Research and Extension Agricultural Experiment Station researchers on campus and at centers around the state conduct studies in nearly all areas of agricultural production. Preliminary reports of research results are now available through KAES Research Reports ( http://newprairiepress.org/kaesrr/ ), an online publication hosted by New Prairie Press at the K-State Libraries.

Current issues are dedicated to the newly completed 2015 Cattlemen's Day report and to field and fertilizer research around the state. Reports will be posted as they become available for issues throughout the year.

Visit the Kansas Agricultural Experiment Station New Prairie Press website to view and download recent reports and issues dedicated to individual topics. Please contact Agricultural Experiment Station Editor Sarah Caldwell Hancock at sarhan@k-state.edu with questions.

## **Bulls** ...continued from page 1

candidates based on conformation and updated data to identify your purchase candidates. Keep the sale order in mind. Stay focused on the bulls you selected earlier. Sticking to your plan will avoid impulse purchases. Remember: Failure to plan is planning to fail. Please contact your extension livestock specialist or me if you need help finding resources to aid in your sire selection activities.

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

| | Treatments | | | | | |
|---|---|---|---|---|---|---|
| Item | Control | 20% CaOH | 40% CaOH | PR>F | 20% CaOH vs. control | 40% CaOH vs. control |
| Body weight, lb | | | | | | |
| Day 0 | 559 | 559 | 559 | 0.79 | 0.97 | 0.55 |
| Day 119 | 806 | 860 | 836 | 0.03 | 0.95 | 0.02 |
| Average daily gain, lb | | | | | | |
| Days 1-28 | 2.90 | 2.85 | 2.16 | <0.01 | 0.71 | <0.01 |
| Days 1-119 | 2.53 | 2.53 | 2.33 | 0.03 | 0.95 | 0.02 |
| Dry matter intake, lb/day | | | | | | |
| Days 1-28 | 13.78 | 13.89 | 13.24 | 0.41 | 0.83 | 0.3 |
| Days 1-119 | 18.35 | 18.89 | 18.07 | 0.53 | 0.46 | 0.71 |
| Feed:gain | | | | | | |
| Days 1-28 | 5.21 | 5.22 | 6.51 | <0.01 | 0.96 | <0.01 |
| Days 1-119 | 7.33 | 7.65 | 7.87 | 0.42 | 0.43 | 0.20 |

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