



Beef Tips

March 2011

Department of Animal Sciences & Industry

www.asi.ksu.edu/beeftips

Upcoming Events

KSU Cattlemen's Day

March 4, 2011
Manhattan, KS
www.KSUBeef.org

Round Up

April 14, 2011
Hays, KS
www.wkarc.org

Beef Improvement Federation (BIF)

June 1-4, 2011
Bozeman, MT
www.beefimprovement.org

Contributors

Dale Blasi

Stocker, Forages Nutrition & Mgt.
785-532-5427
dblasi@ksu.edu

Joel DeRouchey

Environmental Management
785-532-2280
jderouch@ksu.edu

Larry Hollis

Extension Beef Veterinarian
785-532-1246
lhollis@ksu.edu

Sandy Johnson, Editor

Livestock Production
785-462-6281
sandyj@ksu.edu

Chris Reinhardt

Extension Feedlot Specialist
785-532-1672
cdr3@ksu.edu

Justin Waggoner

Beef Systems Specialist
620-275-9164
jwaggon@ksu.edu

Plan for a successful AI breeding season

Sandy Johnson, livestock specialist

Producers targeting specific marketing end points can take advantage of high accuracy sires available via artificial insemination (AI). In a survey of producers that used AI, AI-sired calves were worth over \$100 per head more than natural service sired calves for 31 percent of respondents, \$50 to \$100 more for 17 percent of respondents and \$21 to \$50 more for 24 percent of respondents. The added value of these AI-sired calves emphasizes the importance of maximizing AI pregnancy rates. Numerous factors can play a role in AI pregnancy success and all details should be considered.

Heifers

Heifers must achieve adequate age and weight prior to breeding, but that is not as large of a challenge as it previously was, due to use of genetics that have resulted in more rapid growth rates. Rather, a more common problem seems to be heifers that grow faster than expected and become too fleshy. This may also indicate feed costs could have been reduced. In a large study of commercial heifers, conception rates were higher when heifers gained 1.1 to 1.5 pounds per day compared to heifers that had gains above or below this range. Extremely thin and extremely fat heifers also had reduced conception rates compared to those in moderate body condition.

Nutritional stresses can impact pregnancy rates. In one study, heifers fed 85 percent of maintenance requirements had reduced embryo development on day 3 and 8 compared to heifers fed at 100 percent of maintenance. If heifers have been in the feedlot since weaning, they may have forgotten what they learned about grazing as calves, resulting in flat or negative weight gains when first turned out on grass in the spring. This can be compounded by

washy grass in a wet year or too little available forage in a dry year. In any of these situations, some type of supplementation early in the grazing season may improve conception rates.

Cows

Cows should achieve a body condition score of 5 or greater by calving to ensure most will resume normal estrous cycles by the start of the breeding season. Thin cows will need to achieve a positive energy balance before they begin cycling. Rising feed and pasture costs support using weaning date or timely supplementation to improve cow body condition when cow nutrient requirements are lower rather than waiting until after calving. Young cows represent the biggest challenge to rebreeding because they are still growing in addition to increased nutrient requirements due to lactation. Targeting a body condition score of 5.5 to 6 before calving will help maximize conception rates. Young and/or thin cows would benefit from an estrus synchronization protocol that includes a progestin such as a CIDR to mimic the short rise in progesterone that often precedes the first normal length estrous cycle.

Semen

When failures in reproduction occur in an AI program, semen quality is often overlooked. Semen should be processed by a Certified Semen Service (CSS) provider to ensure basic animal health and quality guidelines have been met. Make certain that the nitrogen level and integrity of the storage tank is monitored year round. Individual straws or canisters should not be exposed above the frost line of the tank for more than 10 seconds, if more time is needed, lower the canister for 30 seconds before continuing. If you hear a noise when a

continued...see Beef Cow Profits on page 6

Breeding soundness evaluation of bulls should include Trich test

Larry Hollis, extension beef veterinarian

As we prepare for this year's bull selection and upcoming breeding season, one tool that we should always utilize is the bull breeding soundness evaluation (BSE). Ahead of the formal evaluation, producers should be looking at their older bull's body condition score. Failure to have bulls in proper body condition (score of 5.5 to 6.0) may keep them from having the energy and drive to breed all the females the first time they detect them in heat. Failure to provide adequate protein and vitamin A may interfere with sperm production.

Additional feed should be provided to make sure that bulls are in adequate, but not excessive, body condition at the time of bull turnout. Also, the bulls' conformation and potential ability to travel over the terrain and find females in heat should be evaluated. If feet or leg problems exist, affected bulls should be examined closely to determine if the problem is temporary or something that will affect their ability to travel. If the problem has potential long-term consequences, plans should be made to replace bull(s) not up to earning their paycheck.

Preferably 90 days prior to bull turnout, all bulls should be vaccinated to match the cows in the herd (with the obvious exception being no brucellosis [Bangs] vaccine!). This timing will reduce the chance that any vaccines will affect the production of sperm, which begins 61 days prior to the time the sperm is completely matured.

Around 60 days prior to bull turnout, bulls should be evaluated for breeding soundness by your veterinarian. The exam should consist of a physical exam including evaluating the general body condition, feet, legs, eyes and the teeth on older bulls. Assuming the bull passes his physical exam, the reproductive tract should be examined next, including the penis, prepuce and internal reproductive organs which can only be evaluated by rectal examination. Assuming the bull passes the reproductive tract exam, a semen sample should then be collected for an on-site microscopic evaluation. The semen evaluation allows the veterinarian to check the volume, concentration, motility and morphology of the individual sperm cells. At any step of the BSE process, a bull may be failed or designated for a retest because there is something detected that suggests he might not be a satisfactory potential breeder. In studies with large numbers of bulls, ten percent of mature bulls tested fail this exam.

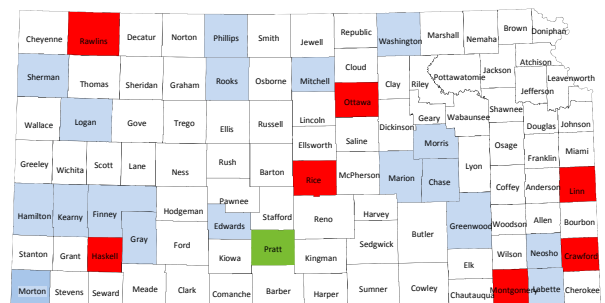
Something new that should be considered for "experienced" bulls is to also have your veterinarian collect a sample that can be used to test for tricho-

moniasis (**Trich**). Do this while the bull is still in the chute but after the semen evaluation has been completed and the bull has passed the total BSE. Collection of the sample at the time of semen evaluation will make life easier for everyone involved, rather than having to run the bull through the chute twice.

Trich testing is something new that should be considered for all "experienced", non-virgin bulls. Virgin bulls that have never been exposed to a breeding-age female will not be carrying this organism and do not need to be tested. However, "experienced" or non-virgin bulls of any age may potentially be carriers of Trich.

Trich has been diagnosed sporadically through the years by the Kansas State Veterinary Diagnostic Laboratory (KSVDL), but the disease has been increasingly diagnosed during recent years (See map below of counties where KSVDL has diagnosed Trich). More bull owners and sellers have started testing for Trich since the new import regulations were put in place during September 2010 (see January 2011 BeefTips), and several more herds have recently had Trich diagnosed after experiencing infertility problems and low calf crop percentages.

Some herds have been spared the devastating effects of Trich by incorporating testing for this sexually-transmitted disease at the time of routine BSE testing of their experienced bulls. Talk with your veterinarian about the risk factors you face that might make Trich testing a good thing for your bulls this year. It is always better to find any positive bulls on pre-breeding evaluations than finding out they had it after the breeding season ended!



Blue – counties affected 1994 to 23 Sep 10

Red – counties affected from 24 Sep to 31 Dec 10

Green – counties affected as of Feb 2011

Source: KAHD

2011 Cattlemen's Day Research Summaries

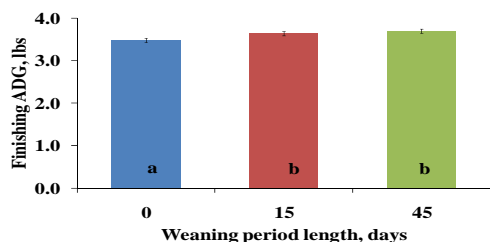
The following represents a sampling of the summaries from the 2011 Cattlemen's Day Report. The entire report is online at: <http://www.asi.ksu.edu/cattlemensday>.

Length of Weaning Period But Not Timing of Vaccination Affects Feedlot Finishing Performance and Carcass Characteristics of Fall-Weaned, Ranch-Direct Beef Calves

M. Macek, J. Iliff, K. Olson, J. Jaeger, T. Schmidt, D. Thomson, and L. Pacheco

Objective: Compare the effects of vaccinating against bovine respiratory disease before weaning at the ranch of origin or after feedlot arrival for calves weaned 45, 15, or 0 days prior to feedlot arrival.

Study Description: A total of 437 Angus x Hereford calves (average initial weight = 458 ± 54 lb) were weighed, stratified by birth date, and randomly assigned to a preshipment weaning period (i.e., 45, 15, or 0 days prior to shipment). Calves were vaccinated against respiratory disease either at the ranch of origin or at the feedlot and were weaned and fed a common weaning diet. On November 5, 2008, calves were transported and commingled at a commercial auction barn and held for 12 hours. Calves were transported 5 miles to a feedlot, adapted to a receiving ration, and fed for 60 days. Steers were then adapted to a common finishing diet. After 165 days on feed, steers were scanned ultrasonically and assigned to one of three harvest dates to meet an endpoint of 0.45 inches of fat depth over the 12th rib. At harvest, hot carcass weights and incidence of lung lesions and liver abscesses were recorded. Following a 48-hour chill, carcass characteristics including 12th rib fat thickness; ribeye area at the 12th rib; kidney, pelvic, and heart fat; USDA maturity grade; USDA yield grade; USDA quality grade; and marbling score were measured by a trained evaluator.



The Bottom Line: A preconditioning period of 45 or 15 days was found to increase feedlot average daily gain and harvest weights compared to no weaning period, but timing of vaccination against respiratory disease did not affect growth performance or carcass merit.

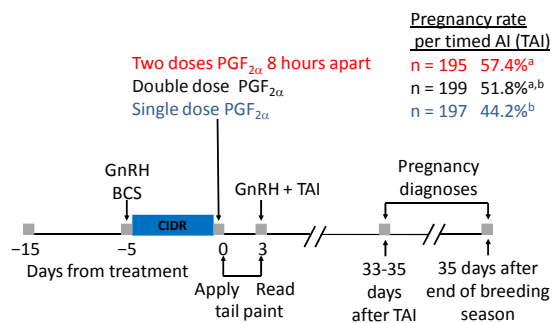
Optimizing a New 5-day CIDR-CO-Synch Timed Artificial Insemination Program

J. Stevenson, S. Pulley, H. Mellieon, K. Olson, J. Jaeger, S. Johnson, D. Grieger, and R. Breiner

Objective: Determine whether a single large or double dose of prostaglandin-F_{2α} (PGF_{2α}) would be as effective as two doses given 8 hours apart to lyse the corpus luteum in preparation for timed artificial insemination (AI). The control was a single dose of PGF_{2α} at progesterone-impregnated controlled internal drug release (CIDR) insert removal.

Study Description: Lactating beef cows at 3 locations (n = 591) in Kansas were treated with the protocol illustrated in the figure below. Cows were assigned randomly to receive at CIDR insert removal: (1) two doses (2 x 5 mL Lutalyse) of PGF_{2α} 8 hours apart with the first dose given at CIDR insert removal, (2) double dose (10 mL Lutalyse), or (3) single dose (5 mL Lutalyse).

Results: Pregnancy rates per AI are shown in Figure 1. Although the two doses of PGF_{2α} given 8 hours apart produced greater pregnancy rates to the timed AI, subsequent pregnancy loss and overall breeding season pregnancy rates did not differ among treatments.



GnRH = gonadotropin-releasing hormone (Factrel); PGF_{2α} = prostaglandin PGF_{2α} (Lutalyse); CIDR = intravaginal progesterone-releasing controlled drug release (Eazi-BREED CIDR); BCS = body condition score. ^{abc} Means having a different superscript differ (P<0.05)

The Bottom Line: The 5-day CIDR-CO-Synch timed AI program is a viable alternative to the standard 7-day program, but it requires administration of two doses of PGF_{2α} to maximize pregnancy rates.

continued...see Research Summaries on page 4

Research Summaries continued from page 3

Marination Technique Influences Whole Muscle Beef Jerky Salt Content and Flavor Intensity

G. Skaar and E. Boyle

Objective: Evaluate how marination technique affects beef jerky by: (1) comparing composition and sensory attributes of beef jerky processed using 24-hour soaking marination or 20-minute vacuum tumble marination, and (2) determining whether a liquid smoke-based anti-mold spray alters the flavor of beef jerky.

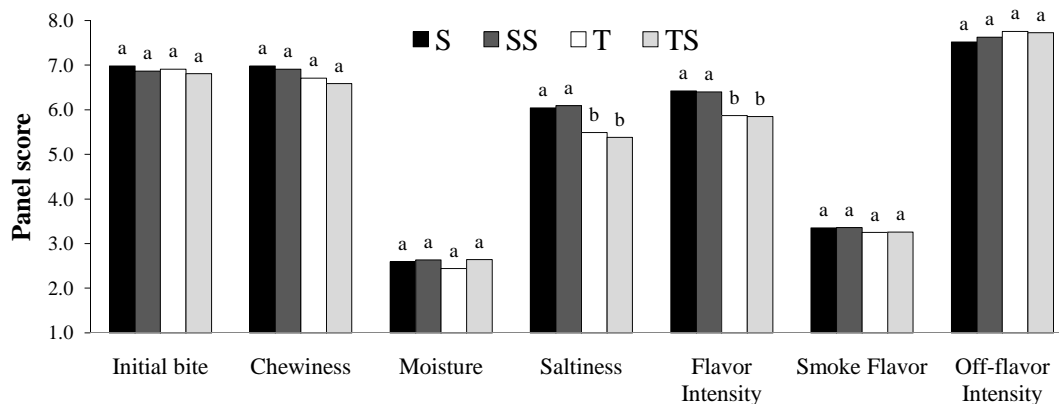
Study Description: Beef jerky was produced using beef inside round and a marinade formulation. The round was sliced and soaked in a tub for 24 hours or vacuum tumbled for 20 minutes. After thermal processing, a liquid smoke-based anti-mold spray was applied to half of the product from each marination technique. Final production treatments were: (1) soaked, not sprayed (S); (2) soaked, sprayed

(SS); (3) tumbled, not sprayed (T); and (4) tumbled, sprayed (TS). Three replications were prepared.

Results: Product marinated by soaking was found to have a 2% higher salt content. The sensory panel also assigned higher saltiness and flavor intensity scores to the jerky that was made with the 24-hour soaking marination method compared with tumbled jerky.

The Bottom Line: Vacuum tumbling as a form of marination for jerky saves time compared with soaking beef slices for 24 hours and may slightly alter jerky attributes. More marinade is needed during tumbling if an equal level of marinade pickup is expected compared with soaking.

Trained panel sensory evaluation[†] of beef jerky marinated by 24-hour soaking or 20-minute vacuum tumbling*, with and without a liquid smoke-based anti-mold spray*



^{ab} Bars within a sensory attribute labeled with a different letter differ ($P < 0.05$).

*S – 24-hour soak marinated; SS – 24-hour soak marinated, anti-mold spray; T – 20-minute vacuum tumble marinated; TS – 20-minute vacuum tumble marinated, anti-mold spray.

[†]A score of 8 for all traits would describe product as extremely firm, chewy, moist, and salty with an intense flavor, abundant smoke flavor, and no off-flavor.

continued...see Research Summaries on page 5

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Voluntary Intake of Prairie Hay Contaminated With *Sericea Lespedeza* (*Lespedeza Cuneata*) By Beef Cows

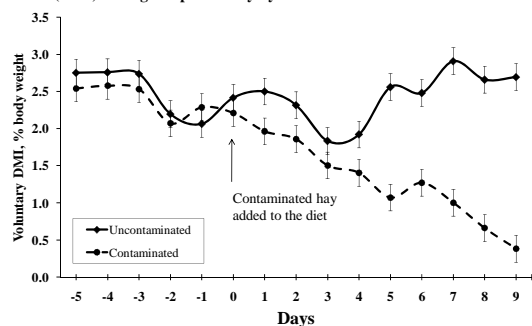
G. Eckerle, K. Olson, J. Jaeger, and L. Pacheco

Objective: Compare intake of tallgrass prairie hay by beef cows when hay was either uncontaminated or heavily contaminated by *sericea lespedeza*.

Study Description: Twenty-four mature beef cows were housed in a single pen and were fed individually either tallgrass prairie hay contaminated with *sericea lespedeza* (approximately 30% by weight) or uncontaminated tallgrass prairie hay. Both sources of hay had similar crude protein (5.5 vs. 5.4%) and acid detergent fiber (41.0 vs. 39.8%) concentrations.

Results: Both groups of cows were fed uncontaminated forage during the first 5 days of the trial (days -5 to -1). We observed no differences in hay intake during this period. Contaminated hay was substituted for uncontaminated hay on day 0, and voluntary intake of hay immediately declined.

Table 1. Effects of *sericea lespedeza* contamination on voluntary dry matter intake (DMI) of tallgrass prairie hay by beef cows



The Bottom Line: Tallgrass prairie hay heavily contaminated with *sericea lespedeza* may be a useful model for study of the appetite-suppressing effects of *sericea*. Furthermore, the major source of appetite suppression by *sericea lespedeza* in sun-cured form was attributed to the post-ingestive consequences of anti-nutritional factors, possibly condensed tannins, rather than anti-palatability factors.

Supplementing Dried Distillers Grains With Solubles to Stocker Cattle Grazing Late-Season Forages Improves Animal Performance and Carcass Characteristics

A. Stickel, T. Houser, K. Olson, J. Drouillard, B. Gerlach, B. Goehring, A. Pacheco, M. Macek, G. Parsons, K. Miller, L. Thompson, M. Dikeman, J. Unruh, and D. Blasi

Objective: Investigate the impact of feeding dried distillers grains with solubles (DDGS) to heavy stocker cattle during late-season grazing on animal performance and subsequent carcass characteristics.

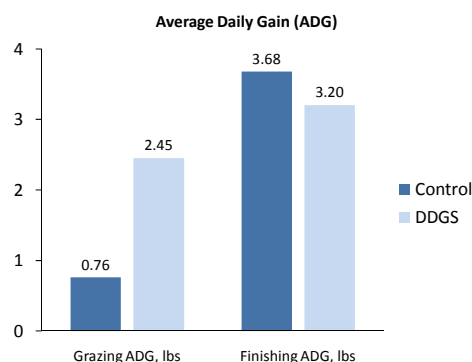
Study Description: Crossbred steers (n = 144; average initial body weight = 808 ± 40 lb) grazed mature and dormant native tallgrass pasture for 90 days. Treatments while grazing were no supplementation or supplementation with DDGS at 1% of body weight (dry basis). Cattle were supplemented daily. Cattle were then placed on feed and carcass characteristics were evaluated after harvest.

Table 1. Effects of grazing supplementation on carcass characteristics

Trait	Control	DDGS
Hot carcass weight, lbs	729.3 ^a	800.1 ^b
Dressing percentage, %	61.1	61.7
Yield grade	2.1	2.2
12th-Rib fat thickness, in	0.27	0.32
Ribeye area, in ²	13.24 ^a	14.01 ^b
Marbling score ¹	387.6	399.6

¹Marbling score: small = 400 to 499; slight = 300 to 399

^{a,b}Means within a row with different superscripts differ ($P < 0.05$).



The Bottom Line: Stocker operators can supplement DDGS while grazing late-season native tallgrass pastures to increase weight gain and improve carcass red meat yield without affecting quality or yield grade. Feedlot operators should be aware that supplemented stocker cattle will be slightly less efficient than non-supplemented stocker cattle during the finishing phase.

AI breeding continued from page 1

canister is lowered back into the tank, it was exposed to warm air too long. Don't thaw more semen than you can use in 10 to 15 minutes and if multiple straws are thawed at once, straws should not touch each other in the water bath. Check the temperature of the thaw unit with an accurate thermometer. Keep the thaw water clean as well as all other equipment used for handling and preparing straws.

Synchronization of Estrus and AI

Selecting an appropriate protocol for synchronization of estrus can seem daunting. A short list of recommended protocols has been identified by the Beef Reproduction Task Force. It contains protocols that combine the potential for high responses, minimal animal handlings and work in a variety of production settings. You can find these protocols listed uniformly in all major sire catalogs and online at www.beefrepro.info under "Resources."

Common reasons for synchronization systems to fail include inappropriate changes to a protocol and giving the wrong product. A tool that can help avoid those problems is the Estrus Synchronization Planner spreadsheet available for free download from the Iowa Beef Center at http://www.iowabeefcenter.org/estrus_synch.html. The planner will help select a protocol, compare protocol costs and develop a calendar that outlines what needs to happen on various days of the selected program. The calendar can be particularly helpful in communicating the planned schedule to everyone involved with the synchronization and breeding program.

When administering synchronization products, be sure to double check that you have the correct product for that day and are using the label-recommended dose. Follow BQA guidelines for administering all treatments.

Heat Detection vs Timed AI

When selecting a synchronization protocol, a key decision is how much time you are willing to commit for heat detection. Additional considerations include available labor, facilities, experience and cost. For cows, fixed-time AI protocols generally produce as many pregnancies as those that use heat detection. In heifers, response to fixed-timed AI is not as consistent (an exception *may* be the 14-day CIDR-PG protocol) and sorting is easier since no calves are involved. Total breeding costs are higher when combining heat

detection and clean-up timed AI, however observing heat provides a check of response to the synchronization protocol which may provide peace of mind if response is in doubt.

Transportation post AI

If heifers or cows need to be transported to a pasture after AI, embryonic loss due to transportation stress is least likely to occur before day 4 after breeding or after day 45. Unfortunately, available research does not answer all questions about details such as length of haul or trailing versus trailering. Heat stress is known to impact embryo development and the embryo is most sensitive early in development. Use low stress handling techniques and avoid over crowded trailers to minimize potential effects.

Whether it is acquiring semen, synchronization products or lining up additional help, plan ahead to have everything in place and in working order. If using synchronization or AI for the first time, helping or observing someone with prior experience and a good synchronization/AI program can be very valuable. Don't expect perfection on the first attempt, but strive to make improvements each year.

Spreadsheet Tool Assesses Supplement Delivery Costs

When considering supplement options for stockers or cows, a good place to start is to compare the cost per pound of crude protein or cost per pound of TDN if supplementing energy. However, with the wide range of options available, there is more than the purchase price of the supplement to consider. SUPPCOST is an Excel spreadsheet designed to analyze the indirect (vehicle/equipment/labor) costs associated with the delivery of supplement programs for beef cattle. The program is available for free download at the KSU AgManager web site at <http://www.agmanager.info/livestock/budgets/production/default.asp> or to go directly to the spreadsheet itself, visit <http://www.agmanager.info/livestock/budgets/production/beef/SUPPCOST.xls>. For more information, contact Dale Blasi (dblasi@ksu.edu; 785-532-5427) or Kevin Dhuyvetter (kcd@ksu.edu; 785-532-3527).