



Beef Tips

March 2008

Department of Animal Sciences & Industry

www.asi.ksu.edu/beeftips

Upcoming Events

Cattlemen's Day

March 7, 2008

Manhattan, KS

www.asi.ksu.edu/

Round-up

April 17, 2008

Hays, KS

See details on page 6

Beef Improvement Federation

June 30-July 3, 2008

Calgary, Alberta, Canada

www.beefimprovement.org/

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Waggoner Beef Systems Specialist at Garden City



Justin Waggoner is the newly hired Beef Systems Specialist at Kansas State University's Southwest Area Extension Office in Garden City.

Waggoner was raised on his family's farm in central Kansas and obtained his Bachelor's (2000) and Master's (2001) degrees in Animal Science from Kansas State University. He completed his Doctorate in Ruminant Nutrition at New Mexico State University in 2007 where his work evaluated the impacts of morbidity on performance and profitability in feedlot cattle and nutrient utilization in stressed cattle.

"As a Kansas native, I am excited about the opportunity to serve beef cattle producers and county agents in Southwest Kansas," Waggoner said.

Waggoner hopes to assist beef cattle producers in all sectors of the industry by providing them with information regarding nutrition and management strategies that improve profitability. Waggoner also intends to continue pursuing his research interests regarding the influence of nutrition and management practices on cattle health and performance.

Waggoner may be reached at the Southwest Area Research and Extension Office in Garden City at (620)-275-9164 or jwaggon@ksu.edu.

Modified stocking strategies increase opportunities

Keith Harmony, rangeland scientist, Agriculture Research Center-Hays

Beef production on western Kansas rangelands is primarily dominated by cow/calf pairs. As a tool to manage pastures during years of low precipitation, producers may also include stocker animals that can be marketed at any time to enable them to destock and restock rangelands without liquidating their main breeding herd.

Intensive-early stocking (IES), a practice that stocks animals at greater densities for the first half of the growing season and then totally removes the animals for the last half of the growing season, effectively utilizes early season vegetation at its highest level of nutrition. On shortgrass rangeland in western Kansas, stockers are typically grazed from May to October under continuous season long stocking (SLS) compared to May to mid-July in intensive-early stocking. Individual animal gains during the early growing season are similar between

animals stocked at twice the normal moderate season-long stocking density (2X IES), and animals stocked at a normal moderate season long (SLS) density (Table 1). Triple stocked intensive-early stocking (3X IES) has also been evaluated in western Kansas, however early season individual animal gains and end of season grass dry matter production (decreases rangeland productivity) are significantly lower.

Total beef production on a per acre basis is similar between double stocked intensive early grazing and season long stocking in western Kansas, while in eastern Kansas intensive early double stocking has significantly greater beef production. Vegetative composition and production are also similar under the two stocking methods in western Kansas.

See Stocking Strategies on Page 2

Stocking Strategies from page 1

“If cow/calf producers want flexibility in their beef cattle operation, the addition of stocker grazing can provide that flexibility.”

Rangelands can also be stocked with a modified intensive early system, but not all modified systems are beneficial in western Kansas. When implementing a modified system at Hays, which stocked at a double stocking rate during the early season and then removed half of the animals at mid-season (2X + 1 IES), early season animal gains were 15% lower than for season long stocking in two out of four years, and full season individual animal gains were 25% lower for the modified system in three of four years.

A slightly different modified intensive early system (1.6X + 1 IES) reduced the density of animals early in the season to 1.6 times normal then removed the heaviest animals at mid-season to leave a lighter set of animals on pasture at a normal density for the last half of the season. The goal of this system was to retain maximum early season gains experienced by season long systems but with greater animal density, and to increase late season gains per animal and gains per acre by allowing more forage regrowth to be available per late season animal unit stocked. Removal of the heaviest animals at mid-season, rather than a random selection of animals, results in heavier, more uniform animals for direct placement into the feedlot.

This 1.6X + 1 modified system with removal of the heaviest animals at the middle of the growing season has been compared to continuous season long stocking from 2002 to 2007 at the KSU Ag Research Center in Hays. No difference has been found between average daily gains and total animal gain for the season long and 1.6X + 1 systems during the first or last half of the season (Table 2). Unlike the previous modified 2x + 1 IES study, animal gains were not reduced during either part of the grazing season, and total season-long gain from animals that remained on pasture from May to October in both the season long and the modified 1.6X + 1

systems were equal. Because animal gains were similar yet stocking rate was greater for the modified 1.6X + 1 system, beef production per acre was greater for the 1.6X + 1 system than the season long (85 lb/acre vs. 69 lb/acre). The increased beef production also created an increase in net income above season long stocking of \$9.84/acre above purchase and interest costs. Vegetative composition and production between the two systems has also been similar during this time span. The only difference thus far in vegetative composition has been that buffalograss composition in the modified 1.6X + 1 system has increased by 0.5 percentage points per year more quickly than the season long system.

The total season stocking rate with the modified 1.6X + 1 system is about 20-25% greater than with season long stocking, and is likely at the maximum level expected to not reduce animals gains or vegetative productivity since 3X and 2X + 1 systems, with stocking rates 50% greater than season long stocking rates, have resulted in rapid declines in animal gain and vegetative productivity.

If cow/calf producers want flexibility in their beef cattle operation, the addition of stocker grazing can provide that flexibility. The research summarized here used steers as the stocker animals, but replacement heifers may also work to initiate a stocker grazing program. An early pregnancy test might be used to selectively remove animals. Further, the option to implement different stocking strategies, SLS, 2X IES, or 1.6X + 1 IES, provides even greater flexibility by offering different times and proportions of animals ready to market. Regardless of the operation, a stocker strategy likely exists that could fit into most beef cow/calf production systems .

Table 1. Data from KSU Ag Research Center - Hays

Stocking System 1980-83, 87-88	Early Season (~May 1-July 15)		Late Season (~July 15-Oct 1)	
	ADG (lb.)	Total Gain (lb.)	ADG (lb.)	Total Gain (lb.)
SLS	1.58	116	1.17	88
2X IES	1.39	109	-	-
3X IES	1.21	89	-	-

Table 2. Data from KSU Ag Research Center - Hays

Stocking System 2002-2007	Early Season (~May 1-July 15)		Late Season (~July 15-Oct 1)	
	ADG (lb.)	Total Gain (lb.)	ADG (lb.)	Total Gain (lb.)
SLS	1.67	124	1.38	108
1.6X + 1 IES	1.49	111	1.39	109

2008 Cattlemen's Day Research Summaries

The following represent a sampling of the summaries from the 2008 Cattlemen's Day Report. The entire report is online at: <http://www.asi.ksu.edu/DesktopDefault.aspx?tabid=1013>

Restricting Vitamin A in Cattle Diets Improves Beef Carcass Marbling and USDA Quality and Yield Grades

A. M. Arnett, M. J. Daniel, and M. E. Dikeman

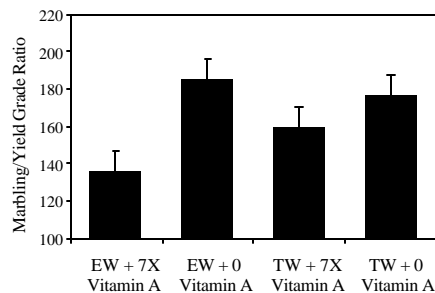
Objective:

Determine the effects of supplementing Angus cross steers, weaned at either early or traditional ages, with either zero or seven times the NRC recommended amount of dietary vitamin A on growth performance, serum and liver retinol content, and carcass quality and yield grades.

Study Description:

Feedlot diets containing either zero or seven times the NRC recommended amount of vitamin A were fed to early-weaned (137 ± 26 days) and traditionally-weaned (199 ± 26 days) Angus cross steers for 235 and 175 days, respectively. Body weights and blood samples were collected, and ultrasound images were obtained periodically throughout the experiment. Cattle were harvested when ultrasound backfat averaged 0.40 inches. Liver, muscle, and fat samples were analyzed for vitamin A and fat content, and carcass data were collected.

Ratio of Marbling produced per USDA Yield Grade in Steers Weaned at Either Early (EW) or Traditional (TW) Ages Fed Diets with Either Very High (7X) or No Supplemental (0) Vitamin A.



Implications:

Feeding no supplemental vitamin A to steers for up to 210 days increases carcass marbling and quality grade without increasing backfat or reducing retail yield. These advantages are enhanced when calves are early-weaned near 140 days of age.

Costs of Adopting Radio Frequency Identification Reader Systems and Tagging Services in Livestock Auction Markets

K. Bolte, K. Dhuyvetter, and T. Schroeder

Objective:

Estimate annualized costs of adopting radio frequency identification (RFID) reader systems and tagging services at livestock auction markets and determine associated economies of size.

Study Description:

A national survey of livestock markets asked livestock market operators 1) if they would offer a RFID tagging service if the National Animal Identification System were fully implemented and 2) if they have adopted a RFID reading system. Operators were asked to provide information about the investments and annual expenses required to offer these services. This information was used to estimate annualized costs of the systems to livestock markets. Economies of size exist in adoption of RFID tagging services and RFID reader systems among livestock auction markets. Costs per head decrease as livestock usage increases when adding either service, and costs per head decrease as facilities increase in cattle volume when a RFID reader system is adopted.

Estimated Annualized Costs of RFID Tagging Services and RFID Reader Systems Among Livestock Auction Markets

RFID Service	Annualized cost per head		
	Avg.	Min.	Max.
tagging service ¹	\$3.21	\$0.00	\$61.49
reader system ²	\$0.76	\$0.14	\$4.02
reader system ³	\$0.19	\$0.04	\$1.01

¹Cost of tagging per head, excludes the cost of RFID tags

²RFID reading cost per head, assuming 25% of cattle sold annually use the system

³RFID reading cost per head, assuming 100% of cattle sold annually use the system

Implications:

Large-volume livestock markets and those that will send a higher percentage of cattle through such a system are more likely adopters of RFID technology than small-volume markets and/or those that would not heavily utilize RFID technology.

2008 Cattlemen's Day Research Summaries, continued

Length of the Weaning Period Does Not Affect Post-Weaning Growth or Health of Lightweight Summer-Weaned Beef Calves

J. W. Bolte, K. C. Olson, J. R. Jaeger, D. U. Thomson, B. J. White, R. L. Larson, G. A. Milliken, N. A. Sproul, and M. D. Thomas

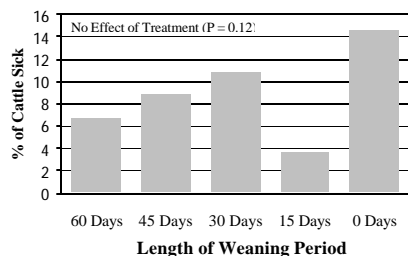
Objective:

Test the validity of beef industry assumptions about the appropriate length of ranch-of-origin weaning periods for summer-weaned calves aged 100 to 160 days.

Study Description:

Angus cross calves (n = 400) were stratified by age and assigned to one of five weaning periods (60, 45, 30, 15, or 0 days) that corresponded to the length of time between separation from dams and shipping to an auction market. Calves were vaccinated against common diseases 14 days before separation from dams and again on the day of separation. On a common shipping date (day 0; August 24, 2007), calves were transported 3 hours to a commercial auction market and held for 14 hours. Calves were then transported 1 hour to a feedlot. All calves were fed the same diet free choice throughout the trial; they also were monitored twice daily for symptoms of respiratory disease. Body condition of dams was assessed 60 days before and 60 days after shipping.

Effect of Weaning Period Length on Incidence of Undifferentiated Fever in Lightweight Calves during the First 30 Days after Feedlot Arrival



Implications:

Under the conditions of our study, ranch-of-origin weaning periods of between 15 and 60 days did not improve calf health or growth performance relative to shipping calves immediately after maternal separation.

Restricted Feeding Improves Performance of Growing Steers During Subsequent Grazing on Native Flint Hills Pasture

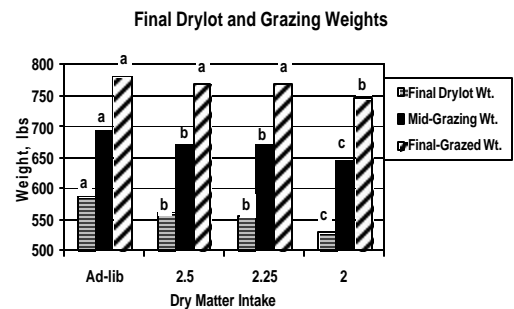
C. O. Anglin, D. A. Blasi, K. C. Olson, C. D. Reinhardt, M. P. Epp, R. D. Derstein, and B. B. Barnhardt

Objective:

Determine if compensatory gain occurs during intensive early stocked grazing following periods of dietary restriction.

Study Description:

Steers were fed at dry matter intakes of free choice or 2.00, 2.25, or 2.50% of body weight for 45 days in a drylot. Intakes were adjusted according to body weight every 14 days. Steers were sorted by weight and treatment and placed on pasture May 1, 2007. Steers were removed from pasture July 28, 2007.



^{abc}Means within a weight period (bar pattern) with different superscripts differ (P<0.05).

Implications:

Restricting steers' dry matter intake to 2.50% or 2.25% of body weight in a drylot will allow steers to compensate in terms of weight gain during early intensive grazing. Limit-feeding can also reduce total production costs.

2008 Cattlemen's Day Research Summaries, continued

Zilmax Improves Performance of Implanted and Non-Implanted Finishing Steers

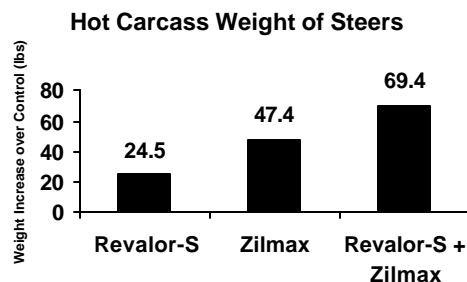
T. J. Baxa, J. P. Hutcheson, M. F. Miller, W. T. Nichols, M. N. Streeter, D. A. Yates, and B. J. Johnson

Objective :

Evaluate performance of finishing steers administered Zilmax during the last 30 days on feed with and without steroidal implants and determine if there is an additive effect with combined use of Zilmax and steroidal implants.

Study Description:

Crossbred steers (n = 2279) weighing 940 lb were used in a 91-day finishing study to compare performance and carcass traits with and without administration of Revalor-S and Zilmax, a beta-adrenergic agonist. Steers received a Revalor-S implant or no implant with and without Zilmax for the last 30 days on feed followed by a 3-day withdrawal. Performance was measured as average daily gain, feed:gain ratio, hot carcass weight, dressing percentage, subcutaneous fat, ribeye area, and marbling.



Implications :

Zilmax improves performance of steers administered steroidal implants. Zilmax and steroidal implants additively stimulate lean growth by steers during the last 30 days on feed.

Crude Glycerin Increases Performance in Finishing Cattle

G. L. Parsons, M. K. Shelor, and J. S. Drouillard

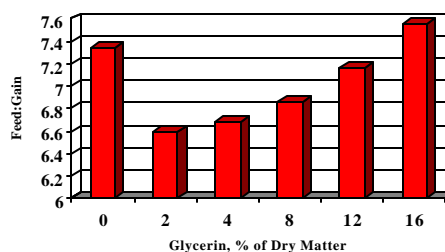
Objective :

Determine the effects of feeding crude glycerin derived from soybean oil to finishing beef cattle.

Study Description:

Crossbred yearling heifers (n = 375; 929.5 ± 63 lbs) were fed finishing diets containing 0, 2, 4, 8, 12, or 16% crude glycerin (dry matter basis). Cattle were blocked by initial weight and assigned to one of the six diets with six to seven animals per pen and nine pens per diet. Cattle were housed in 54 concrete-surfaced pens (392.9 ft²) with roofs covering feed bunks and half the pen. Diets consisted of steam-flaked corn with 6% alfalfa hay and 1.2% urea and provided 300 mg monensin, 90 mg tylosin, and 0.5 mg melengestrol acetate per animal daily. Cattle were transitioned from the control diet (no glycerin) to diets containing increasing proportions of glycerin over a period of 10 days. Cattle had free choice access to feed, and diets were delivered once daily throughout the 85-day trial.

Effect of Dietary Glycerin on Feed: Gain



Implications :

Adding glycerin to cattle finishing diets improved weight gain and efficiency, particularly when added at levels of 8% or less of the diet dry matter.

2008 Cattlemen's Day Research Summaries, continued

Packaging Atmospheres Alter Beef Tenderness, Fresh Color Stability, and Internal Cooked Color

J. P. Grobbel, M. E. Dikeman, M. C. Hunt, and G. A. Milliken

Objectives:

Evaluate the effects of different packaging atmospheres on beef strip loin tenderness, fresh color stability, and internal cooked color.

Study Description:

Select strip loin steaks were packaged in high-oxygen (HiO₂) modified atmosphere packaging (MAP), ultra-low oxygen blends with carbon monoxide (ULO₂CO) modified atmosphere packaging, or vacuum packaging (VP). Instrumental tenderness and instrumental internal cooked color were measured, and fresh display color was scored by trained panelists. Steaks for instrumental tenderness and internal cooked color were cooked to 158°F, a medium degree of doneness.

Results:

- Steaks packaged in high oxygen modified atmosphere packaging discolored faster and to a greater extent than steaks in all other packaging treatments.
- Steaks packaged in ultra-low oxygen blends with carbon monoxide modified atmosphere packaging had tenderness equal to or better than steaks packaged in high oxygen modified atmosphere packaging.
- Packaging atmospheres altered internal cooked color, with steaks packaged in high oxygen modified atmosphere packaging exhibiting premature browning.
- Strip loin steaks packaged in high oxygen modified atmosphere packaging were less tender at the end of display than steaks in other packaging treatments, which could be a result of the shorter aging time associated with the high oxygen packaging system.

Implications:

Packaging beef in ultra-low oxygen blends with carbon monoxide modified atmosphere packaging provides a bright red color with extended color stability, allows for a longer aging time and increased tenderness, and results in an internal cooked color that is expected for a medium degree of doneness, all of which are beneficial to the meat industry.

Research Roundup to be held in Hays

The 2008 Research Roundup at the Agricultural Research Center in Hays will be returning to the demonstration arena at the feedlot for its annual program which begins with registration at 11:30 on Thursday, April 17th. An overview of ongoing research projects including relationships between marbling and loin muscle depth on cow productivity, preconditioning and weaning management, sensors to monitor illness in cattle and a walking tour will all take place onsite at the feedlot. The program continues in the auditorium with discussion of a variety of research projects involving topics such as Vitamin A, stocker options, zilpaterol, choline and preconditioning. The keynote presentation will be from Jim Drouillard, ruminant nutritionist with KSU summarizing recent studies on use of distiller's byproducts. For more information call 785-625-3425.