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Agenda

2026

8:30 – 9:00 am Registration and Visit Vendors

9:00 to 9:45 – Research Hot Round 1 – Cow-Calf Production Systems

9:00 Effects of castration using lidocaine-infused castration bands, regular castration bands, and surgical castration at key industry timepoints
Carter Phillips, U of Ark

9:15 Characterization of daily feeder attendance and blood urea nitrogen dynamics in mature beef cows grazing native range
Caitlyn Kleffner, OSU

9:30 Gene editing the slick mutation to mitigate fescue toxicosis losses
Lucas Branco, Mizzou

9:45 – Corn silage supplementation during gestation effects on cow and calf performance in fescue and bermudagrass systems
Jaymelynn Farney, K-State

10:00 – 15-minute break

10:15 to 11:00 – Research Hot Round 2 – Reproduction

10:15 The effects of diets containing soybean oil formulated for developing heifers on reproductive efficiency and calf growth performance
Bella Becerra, U of Ark

10:30 Used but not useless: reusing CIDRs in estrous synchronization programs
Lucas Branco, Mizzou

10:45 Evaluation of conventional vs sexed-sorted semen for fixed-time artificial insemination during a 14-day estrous synchronization in mature beef cows
Jacy Riddle, U of Ark

11:00 – 15-minute break

11:15 – Keynote address: Selecting a profitable replacement heifer - NPV

Jordan Thomas, Mizzou

12:00 to 12:45 – Lunch, Sponsor Recognition

12:45 to 1:30 – Research Hot Round 3 – Stocker production systems and forages

12:45 Supplementation delivery strategies for calves grazing low-quality pasture

Paul Vining, OSU

1:00 Feeding and stocking strategies to improve productivity and control invasive grasses

Emma Briggs, K-State

1:15 Performance of steers grazing summer cover crops with and without N fertilization

Cody Gruber, OSU

1:30 – 15-minute break

1:45 to 2:15 – Research Hot Round 4 – Stocker Systems

1:45 Effects of Stocker Steer Performance while Consuming Essential Oil or Ionophore Mineral

Jaymelynn Farney, K-State

2:00 Asian longhorned tick and Theileriosis – New Updates

Kirsten Midkiff, U of Ark

2:15 Effects of red seaweed supplementation frequency on methane emissions in beef cattle

Sam Talley, Mizzou





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Effects of castration using lidocaine-infused castration bands, regular castration bands, and surgical castration at key industry timepoints

Carter Phillips, Dr. Maggie Justice, Dr. Kirsten Midkiff, Dr. Jeremy Powell, Dr. Daniel Rivera

Introduction: Castration is a common husbandry practice in the beef industry performed to reduce aggression and improve meat quality. However, castration has been shown to cause pain which can lead to stress and potential reductions in short-term productivity. Recently, castration bands with local anesthetics infused have been developed to provide localized pain relief during the procedure.

Objective: The objective of this study was to evaluate the efficacy of a lidocaine-infused castration band compared with traditional band castration and surgical castration performed at different timepoints, with respect to stress markers, performance, and activity.

Study Description: Fifty-two male beef calves (average body weight [BW] = 98 kg) from the University of Arkansas Division of Agriculture Livestock and Forestry Research Station were randomly assigned by BW to one of three treatments: lidocaine-infused band castration (LC), traditional band castration (BC), or surgical castration (SC). LC and BC were castration at branding (average age = 90 d), whereas SC was performed at weaning. Body weights were collected at banding castration (d0), d7, every 28 d through weaning, and then during a 60-d post-weaning grazing period. During this grazing period calves were supplemented with corn gluten feed at 0.5% BW. Blood samples for complete blood count (CBC) and serum haptoglobin analysis were collected from a subsample (n=6 calves per treatment) on d0, d1, d3, and d7 post-castration. Accelerometers were fitted to another subsample of calves to monitor activity from d0 – d7 post-castration event.

Results: There was no overall treatment effect on average daily gain (ADG) across the study ($P = 0.066$). However, a treatment \times period interaction was observed for ADG ($P = 0.020$), indicating short-term performance differences among castration methods. Long-term performance from branding through the post-weaning phase did not differ among treatments. No overall treatment effect was detected for serum haptoglobin concentrations ($P = 0.083$); however, a significant day effect was observed, with increased concentrations on d 1, d 3, and d 7 post-castration ($P < 0.001$). Similarly, no overall treatment effect was detected for CBC variables ($P = 0.637$), though significant effects of period ($P = 0.008$), parameter ($P < 0.0001$), and a period \times parameter interaction ($P < 0.0001$) were observed.

Bottom Line: Lidocaine-infused castration bands exhibited no benefits in pain reduction, performance. Considering the cost of the product and the tendency to decrease performance for a short period, this product is not economical. Further research into new technology to improve animal welfare during castration is warranted.



Characterization of Daily Feeder Attendance and Blood Urea Nitrogen Dynamics in Mature Beef Cows Grazing Native Range

Caitlyn Kleffner

Objective: The objective of this study was to characterize the feeding behavior of mature beef cows grazing native range using a 4-wheel lick tank equipped with an automated tag reader system.

Study Description: Nineteen mature Angus and Angus-cross cows were monitored for 25 days following a 28-day adaptation period at the Oklahoma State University Range Cow Research Center. Each cow was fitted with an ultra-high-frequency RFID tag, and feeder visits were recorded using an automated tag reader that captured start and end times. Cows had ad libitum access to supplement; however, individual intake was not measured. Data were summarized by hour, day, and individual cow to evaluate attendance patterns, visit duration, and daily feeder use. Blood urea nitrogen (BUN) was measured to examine its relationship with supplement feeding behavior.

Results: Cows showed highly consistent feeder attendance, visiting an average of 25 ± 1 days. Mean visit duration was 5.0 ± 3.6 minutes, and total daily feeder time averaged 31.5 ± 10.5 minutes, though time spent at the feeder varied among days. Feeder activity was greatest between 4 PM and 11 PM (56% of visits), and BUN was positively correlated with total feeder visits ($r = 0.79$) and daily feeder time ($r = 0.67$), indicating the tag reader effectively reflected supplement intake.

Summary of Feeding Behavior, Feeder Use, and Blood Urea Nitrogen in Grazing Beef Cows Monitored with an Automated Lick Tank System

Measurement	Mean	Standard deviation	Max	Min
Body Weight (lbs.)	1401	145	1670	1228
Visit Duration (min)	5.0	3.6	31.2	0.1
Daily Total Time at Feeder (min)	31.5	10.5	47.9	12.5
Feeder Visits Per Day	6	2	9	3
Total Feeder Visits	157	42	231	76
Blood Urea Nitrogen (mg/dL)	9.0	2.8	12.0	2.0

The Bottom Line: Automated tag reader systems can reliably monitor supplement feeding behavior in grazing beef cows and may serve as a practical tool for producers to better understand and manage supplement intake.

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Gene Editing the Slick Mutation to Mitigate Fescue Toxicosis Losses

Lucas Branco, Juliet Henning, Raquel Franco de Oliveira, Gabriela Dasqueve, Caleb O’Neal, Tad Sonstegard, Cecilia C. Rocha

Introduction: Tall fescue pastures support ~40% of U.S. cow–calf herds, but fescue toxicosis is associated with major production losses. A “slick” hair phenotype through the slick mutation gives animals short, sleek hair that can improve heat dissipation and may help cattle cope with heat stress under fescue toxicosis.

Objective: The objective of this ongoing project was to evaluate early-life development, vigor, and heat-related behaviors of calves generated from an Angus sire gene-edited (CRISPR-Cas9) to carry the slick mutation while grazing toxic tall fescue.

Study Description: Multiparous Angus cows (n = 222) were AI-bred to a gene-edited Angus bull carrying the slick mutation. Fall-born calves were classified as slick (n = 64) or wild-type (n = 28). At birth, body weight and hair length were recorded; time to stand and to nurse (calf vigor) was assessed in a subset (n = 13). At 30 d, respiratory rate, panting score, and behavioral scans (shade/sun use and activity) were collected. At 60 d, body weight/shape, hair length, hair weight, and rectal and superficial temperatures were measured.

Results: Slick calves had 0.39 cm shorter hair at birth ($P < 0.0001$) with no difference in birth weight ($P = 0.2276$); vigor did not differ ($P \geq 0.1189$). At 30 d, slick calves had lower panting score (-0.591 ; $P = 0.0011$) and respiratory rate ($P = 0.0012$), and more were observed under the sun ($P = 0.0070$). At 60 d, slick calves had shorter, lighter hair ($P < 0.0001$) and greater shoulder-to-rump length ($P = 0.0387$), with no body weight difference ($P = 0.2621$). Superficial temperature did not differ at the eye or nostril ($P \geq 0.2273$), but was greater at the neck ($+0.81^\circ\text{C}$; $P = 0.0003$) and metatarsus ($+1.59^\circ\text{C}$; $P = 0.0020$) in slick calves.

Table 1. Key slick vs wild-type differences

Outcome	Age	Slick	WT	Difference	P-Value
Hair Length (cm)	Birth	1.34	1.73	0.39	<0.0001
Resp. Rate (bpm)	30d	61.03	103.40	42.37	0.0012

The Bottom Line: Gene-edited slick calves have similar or increased performance as wild-type calves during fall and early winter in Midwest regions with consistently shorter, lighter hair, lower panting score and respiratory rate at 30 d, and more time under the sun, suggesting greater heat tolerance. Greater superficial temperature in slick calves could be explained by slick calves having shorter hair, making the infrared sensor likely to capture temperatures closer to the skin surface, increasing measured surface temperature.



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Corn Silage Supplementation during Gestation and Early Lactation effects on Cow and Calf Performance in Fescue and Bermudagrass Systems

Jaymelynn Farney and Tatiana Jones

Objective: To determine if supplemental feeding of corn silage will offset fescue toxicity issues in fescue or be used to enhance forage availability in bermudagrass systems with cow-calf pairs.

Study Description: Study was conducted over two years. Fall calving cows (n = 45-48 per year) grazed 16 fescue pastures where half were non-toxic varieties of fescue and the other half were toxic varieties of fescue from mid-gestation to ~60 days into lactation. Half of each of these cows were supplemented with 1% of body weight as corn silage daily, while the others were not. In the Bermudagrass trial, fall-calving cows (n = 24 per year) grazed bermudagrass pasture (n = 8) where half the pastures were fed with 1% corn silage and the other half were not. Bermudagrass cows grazed from mid-gestation until calving. Cow weights, calf weights, and pasture biomass were measured at specific stages of production.

Results: *Fescue study:* There were minimal fescue type x supplementation effects. Cows grazing toxic fescue had lower weight gains during gestation, more hair length, greater hair scores, and lighter calf birth weights. Calf weaning weights tended to be greater when dams grazed non-toxic fescue and were supplemented with corn silage than from dams that were grazing toxic fescue, regardless of supplementation. Supplementation with corn silage resulted in cows having greater weight gain through entire feeding period, especially in early lactation and during early lactation less pronounced loss of body condition. Supplementation during gestation did not affect calf birth weight or cow milk production. Supplementation tended to increase available forage mass by 7.5% over non-supplemented pastures.

Bermudagrass study: Averaged over the 2 years, supplementing pregnant cows with corn silage while grazing bermudagrass did not affect cow body weight, body condition score, calf birth weight, or cow milk production. Calves from dams that were not supplemented weighed ~18 lbs more than those that were supplemented corn silage during gestation. There was no difference in available forage between supplementation methods.

Bottom line: Replacing toxic fescue with non-toxic varieties results in better cow and calf performance. Diluting toxicity with corn silage at close to half of the cow's diet, did not offset some of the toxicity issues, however, did result in more forage available. Supplementing cows grazing bermudagrass during growing season had no impacts on cow, calf, or forage production.



Effects of inclusion of soybean oil in beef heifer diets on reproductive efficiency and calf growth performance

Bella Becerra, Kirsten Midkiff, Beth Kegley, Robin Cheek, Jacy Riddle, Doug Galloway, Jana Reynolds, Alexis Harness, Charles Looney, Brittni Littlejohn, and Jeremy Powell

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Introduction: Soybean co-products are widely used among swine and poultry diets, especially soybean meal, with the beef cattle industry accounting for a small portion of soybean meal use in recent years (6.8%). Fat supplementation is important for hormone synthesis and other physiological properties in cattle, which is important for developing heifers. Proper nutrition and management are key for heifers to reach puberty at an early age and establish a viable pregnancy; however, soybean co-products are not only expensive but show variable results relating to reproductive efficiency in cattle. If soybean co-products can be utilized in developing heifer diets without sacrificing economic viability, there may be a market for utilizing the co-products to benefit reproductive function and subsequent calf performance.

Objective: The objective of this study was to evaluate effect of including soybean oil in developing heifer diets on body weight and body condition scores, puberty and cyclicity status, conception rates, corpus luteum and uterine artery hemodynamics, and calf performance at birth and weaning.

Study Description: 80 Angus crossbred heifers were sorted randomly to 1 of 2 treatment groups, being: 1) control group fed a grain supplement with no soy product (CON); and 2) treated group fed a grain supplement with soybean oil at 2% of estimated dry matter intake (SBO). Supplements were offered beginning 30 days after weaning and continued through the breeding season. Blood was collected at 7-day intervals beginning on day 56 of the study to measure serum progesterone concentrations for puberty and cyclicity status. Heifers were bred by artificial insemination (AI) at approximately 14 months, and confirmation of AI pregnancy and overall pregnancy was determined at 204 and 279, respectively. Finally, body weights and calf morphometric measurements were obtained at birth and weaning.

Results: By study design, body weight was not different between treatment groups. No differences were found between CON and SBO supplemented dams on body condition scores, puberty or cyclicity status, AI or overall conception rates, or uterine blood flow. The corpus luteum area was greater in CON supplemented dams, but blood perfusion was similar between treatment groups. Calves born to SBO supplemented dams had a greater heart girth and cannon bone circumference at birth, but no other measurements were different between treatment groups at birth or weaning.





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Used but Not Useless: Reusing CIDRs in Estrous Synchronization Programs

Lucas Branco, Juliet Henning, Amanda G. Silva, Abigail Diggs, Luisa Alegro, Payton Griffin, Thiago Martins, Cecilia C. Rocha

Introduction: Controlled internal drug release (CIDR) devices are widely used in estrous synchronization programs for beef cattle, but the CIDR can represent ~85% of the protocol cost. Reducing CIDR costs through safe reuse could increase the adoption of timed AI programs.

Objective: The objective of this experiment was to determine the effect of CIDR reuse number on follicular diameter, estrus distribution and expression, and pregnancy per AI (P/AI) in lactating *Bos taurus* beef cows.

Study Description: A field trial was conducted across ten beef operations in Missouri, USA. Lactating, predominantly Angus cows were assigned to CIDR0 (new) or CIDRs reused 1–3 times (each use for 7 days) and underwent a 7-d CO-Synch + CIDR timed AI protocol. Cyclicity was determined by ultrasonography at protocol initiation. At CIDR removal, ovarian ultrasonography (largest follicle diameter) was performed, and estrus patches were applied. Timed AI occurred ~60–66 h after CIDR removal; pregnancy was diagnosed by ultrasonography 30–35 d after AI. A subset of cows (n = 446) was monitored to estimate estrus onset and proestrus length.

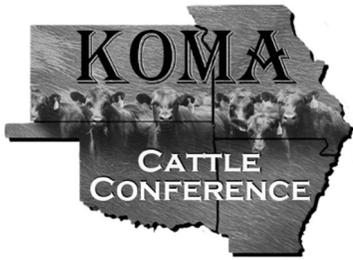
Results: A total of 1,235 cows were included in the analysis. Overall, 68.6% were cyclic at D–10, 55.9% expressed estrus by TAI, and P/AI was 44.9%. Follicle diameter on D–3 increased linearly as CIDR reuse number increased, and time-to-estrus differed among treatments, with earlier estrus onset for CIDR2–CIDR3 relative to CIDR0–CIDR1. Estrus expression by TAI was not affected by treatment but differed by parity. Treatment affected P/AI in primiparous cows (lowest with CIDR3), whereas multiparous cow P/AI did not differ among CIDR groups.

Table 1. Effects of CIDR reuse number on model-predicted pregnancy per AI (P/AI) within parity in lactating beef cows.

Preg/AI	CIDR0	CIDR1	CIDR2	CIDR3	P-Value
Primiparous	35.17 ^b	41.30 ^{ab}	37.04 ^b	18.55 ^c	0.0033
Multiparous	56.55 ^a	56.36 ^a	53.05 ^{ab}	50.57 ^{ab}	0.5795

^{a,b,c}Means differ within row ($P < 0.05$)

The Bottom Line: CIDRs can be reused in 7-day synchronization programs without compromising estrus expression, but reuse alters follicular dynamics. As CIDR use increased, follicle diameter and estrus occurred earlier (CIDR2–CIDR3). Pregnancy per AI did not differ in multiparous cows, but declined in primiparous cows with CIDR3, suggesting that reuse up to two times is recommended in cows.



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Evaluation of conventional vs sexed-sorted semen for fixed-time artificial insemination during a 14-day estrous synchronization in mature beef cows

Jacy Riddle, Jeremy Powell, Bernie Krumpelman, Bryan Bacher, Robin Cheek, Cody Bright, Evelyn Gilbreth, and Charles Looney

Introduction: Estrous synchronization and artificial insemination (AI) allow beef producers to maximize genetic improvement in their operations. Recently, new technology allows the incorporation of sex-sorted semen into AI programs providing producers a method to shift or control the gender ratio of their calf crop for genetic or economic advantages. However, sexed semen is not widely used due to concern of reduced conception rates and increased costs.

Objective: The objective of this study was to compare pregnancy rates in cows inseminated following a 14-day controlled internal drug release (CIDR) protocol with frozen semen from 2 sires each stored conventionally or female sex-sorted.

Study Description: Crossbred Angus cows ($n = 200$) were allocated randomly to 1 of 2 treatment groups by pre-breeding weight and body condition score (BCS), as well as calving date, cow age, and parity. Treatment groups were 1) cows received conventional semen; 2) cows received sexed-sorted female semen, with the 2 sires represented in each treatment. All cows were synchronized using an 8&6 d synchronization protocol.

Results: There were no differences in FTAI pregnancy rates ($P = 0.71$), estrus expression ($P = 0.88$), or tone scores ($P = 0.27$) between treatments. Cows bred to conventional semen had a 74% conception rate and cows bred to sex-sorted semen had a 72% conception rate to FTAI. These data suggest that sex-sorted semen performs comparably to conventional semen when used in a 14-day synchronization program.

Table 1. Effect of semen type on estrous response and pregnancy rates.

Item	Semen Treatment in Beef Cows		
	Sexed-sorted	Conventional	P-value
Cow expressing estrus	93/100 (93%)	90/100 (90%)	0.88
Uterine tone expression	72/100 (72%)	77/100 (77%)	0.27
AI pregnancy rate	72/100 (72%)	74/100 (74%)	0.71
Overall pregnancy rate	95/100 (95%)	95/100 (95%)	1.0

The Bottom Line These data suggest that sex-sorted semen performs comparably to conventional semen when used in an 8&6-day synchronization program. These results may increase the overall utilization of a 14-d FTAI protocol when beef cattle producers choose to use sex-sorted semen to capture improved genetics via artificial insemination.



Two-Year Assessment of Supplementation Feeding Strategies on Stocker Calf Performance Grazing Mixed Grass Prairie in Western Oklahoma

Paul Vining

Objective: To evaluate the delivery method and frequency of dried distillers' grains (cube vs tub) supplement on stocker steer performance.

Study Description: Growing steers grazing rangelands during the summer often require supplementation to offset nutrient deficiencies and achieve adequate body weight gain. This is due to a dramatic decrease in native forage nutrient quality throughout the summer months. Dried distillers grains (DDGS) make an excellent supplement for beef cattle. Dried distillers grains are commonly supplemented to grazing cattle in the form of a ¾ in. diameter “cube” or a hydraulically pressed block “tub”. Tubs commonly cost much more than cubes. However, tubs require less frequent placement and save time, labor, and fuel costs compared to feeding cubes more frequently.

Results: Average daily gain did not differ between treatments during early season or late season ($P \geq 0.178$), nor across the total grazing season ($P = 0.204$).

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Table 1. Effect of DDGS Supplement Delivery Method on Performance of Growing Steers Grazing Mixed-Grass Prairie Pastures in Western Oklahoma (Summary of Two Grazing Trials 2024-2025).

	Treatment		SE	P-Value
	Tub	Cube		
Body Weight, lbs.				
Initial	629	624	2.5	0.994
Middle	736	743	7.0	0.468
Final	900	904	5.1	0.649
ADG, lbs./d				
^a Period 1	1.50	1.63	0.088	0.178
^b Period 2	2.18	2.21	0.089	0.819
^c Total	1.85	1.91	0.066	0.204

^aPeriod 1 (2024; Early-June – Mid-August, 2025; Mid-May – Mid-July)

^bPeriod 2 (2024; Mid-August – Late October, 2025; Mid-July – Early October)

^cTotal (2024; 140 grazing days, 2025; 145 grazing days)

The Bottom Line: A cost sensitivity analysis indicated that a round-trip feeding route of 54 miles was required for reduced delivery costs to offset the higher cost of tubs. In conclusion, supplementation using DDGS tubs was as effective as hand-feeding DDGS cubes three times per week for stocker calves grazing mixed grass prairie in western Oklahoma.





Feeding and Stocking Strategies to Improve Productivity and Control Invasive Grasses

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Objective: To evaluate feeding and stocking strategies that improve cattle productivity and reproductive performance while also assessing the use of distiller’s grains as a tool to enhance animal production and manage invasive grasses.

Study Description: Study 1 evaluated 480-lb stockers supplemented with dried distillers grains (1.5 lb/hd/day; 0.40 lb CP) for 10 weeks (July–October) across bunk-, ground-, and control pastures, with weights collected May, July, and October. Study 2 compared continuous season-long stocking (CSLS) and modified intensive early stocking (MIES) in 474 replacement heifers, measuring performance, reproduction, and pasture biomass.

Results: In Study 1, applying dried distillers grains on the ground improved late-season stocker gains and reduced invading old world bluestem in small patches, indicating potential to enhance performance while aiding invasive grass management. In Study 2, available pasture dry matter did not differ between CSLS and MIES. Stocking system affected early-season ADG, with greater gains under CSLS during May-July ($P \leq 0.05$); however, mid- to late-season and season-total ADG were similar. Gain per acre was greater under MIES, reflecting higher stocking rate and improved land-use efficiency, while body weight and condition score remained consistent

Table 1: Effect of Feeding Strategies on Total Gain and Average Daily Gain of Grazing Cattle

Treatment	Total Gain (lb/hd)			ADG (lb/hd/d)		
	Early	Late	Total	Early	Late	Total
Bunk	93	102 ^a	195	1.26	1.40 ^a	1.33
Ground	96	98 ^a	193	1.30	1.34 ^a	1.32
Control	105	82 ^b	186	1.42	1.12 ^b	1.28

Different letters in columns $P \leq 0.05$

Table 2: Heifer body weight during the grazing season

Treatment	Initial BW, kg	Midpoint BW, kg	Final BW, kg	FSCR, %	AI Retention, %
CSLS	352	411*	439	53	52*
MIES	355	406*	440	47	72*

BW = body weight, CSLS = continuous season long stocking, MIES = modified intensive early stocking, FSCR= first service conception rate to timed AI, AI Retention = % percent of heifers pregnant to AI left on pasture at the end of season
*Indicates statistically different values at $P \leq 0.05$

The Bottom Line: Strategic feeding with distiller’s grains and appropriate stocking methods can maintain or improve cattle performance while also serving as practical tools to enhance productivity and help manage invasive grasses in grazing systems.





Performance of Steers Grazing Summer Cover Crops with and without N Fertilization

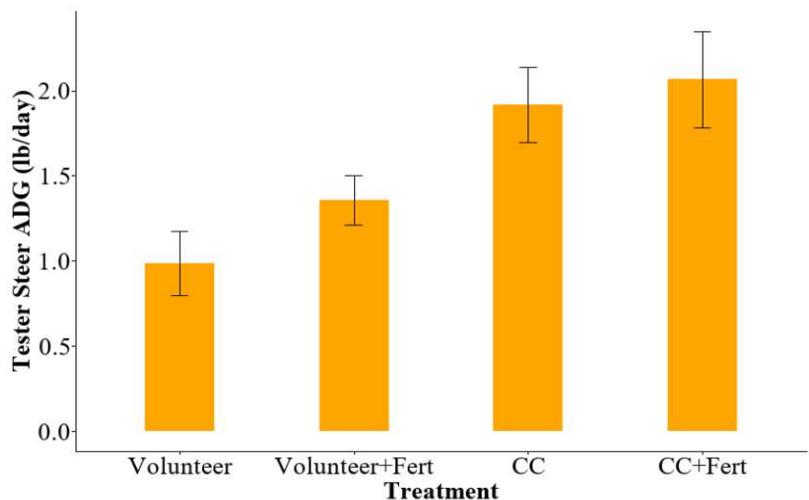
Cody Gruber

Objective: Our objective was to determine if implementing summer cover crops with or without added nitrogen fertilizer would improve steer performance when compared to volunteer warm-season annual grasses in a summer fallow wheat cropping system.

Study Description: During the summer of 2025, 40 steers (741 ± 110.9 lbs) grazed 8 pastures at the Wheat Pasture Unit in Stillwater, OK from June 19th to August 14th. Grazed pastures were either planted in May with a cover crop mixture, containing cowpea, mung bean, BMR sorghum sudan, sunn hemp, and okra, or were allowed to transition to volunteer warm-season annual grasses, primarily made up of crabgrass. Additionally, half of the pastures were fertilized with urea to bring each pasture up to a rate of 107 lbs N/ac. This resulted in four treatments: CC (cover crops without added N), CC+Fert (cover crops with added N), Volunteer (volunteer grasses without added N), and Volunteer+Fert (volunteer grasses with added N).

Results: Pastures planted with the studied cover crop mixture displayed improved individual steer ADG, resulting in greater total BW gain. While grazing days/ha were increased for volunteer forages, BW gain/ac was unaffected by forage type. While additional N fertilizer did not improve individual BW gain, BW gain/ac increased with fertilization, regardless of crop species.

Figure: Steer gain/ha with or without cover crops and additional N fertilizer



The Bottom Line: Grazing warm-season cover crops successfully improved individual animal BW gain, while N fertilization benefitted steer weight gain/ac.

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Effects of Stocker Steer Performance While Consuming Essential Oil or Ionophore Mineral

Jaymelynn Farney and Tatiana Jones

Objective: To determine if essential oils offer the same performance as stocker steers consuming an ionophore.

Study Description: Steers (n = 562 head over two years) were assigned to one of two mineral treatments and grazed tallgrass native range on eight pastures. Treatments consisted of a “positive” control of ionophore mineral (lasalocid at 1,633 g/ton) or an essential oil mineral (garlic oil at 3 lb/ton and essential oil blend at 18 lb/ton) offered free choice to four pastures each within each year. Steers were weighed at the beginning and end of the grazing period (90-92 days). Pasture biomass and mineral intake were measured weekly.

Results: Averaged over the two years there was no difference in steer average daily gain whether consuming the essential oil or ionophore mineral ($P = 0.27$). Steers in the second year consuming the ionophore mineral tended ($P = 0.09$) to have ~14 lbs greater gain but in the first year there was no difference in total gains. Mineral intake was the same in Year 1 but, in Year 2 the ionophore fed steers consumed 15% more mineral than the essential oil steers. There was no difference in forage biomass production between mineral treatments, and there was greater biomass in Year 2 than in Year 1.

Table 1. Effects of mineral type on cattle performance averaged over 2 years of grazing tallgrass native range.

Item	Essential		SEM	P-Value
	Ionophore	Oil		
Initial weight, lbs	641	679	5.44	0.30
Final weight, lbs	865	871	4.94	0.48
Total gain, lbs	211	204	4.94	0.28
Average daily gain, lbs/d	2.29	2.20	0.005	0.27

Ionophore mineral (Bovatec 91 included at 18 pounds per ton to provide 1,633 g/ton lasalocid; Zoetis, Kalamazoo, MI).

Essential oil: essential oil mineral (3 pounds per ton garlic oil and 6 pounds per ton of Solace; Wildcat Feeds LLC, Topeka, KS).

SEM: standard error of means

The Bottom Line: The essential oil blends evaluated did not have different gains than lasalocid when fed to stocker steers grazing double stock tallgrass native range.





Surveillance for the prevalence of Asian Longhorned ticks and *Theileria orientalis* in Arkansas

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Introduction: The Asian Longhorned tick, *Haemaphysalis longicornis*, is an invasive tick species native to East Asia that was first detected in the United States as early as 2010. The tick was first found on livestock in 2017. Since then, the tick has spread to 21 states across the eastern United States. The tick carries a pathogen causing Theileriosis in cattle, caused by infection with *Theileria orientalis*. The protozoan pathogen is transmitted from the bite of an infected Asian Longhorned tick, or by contaminated needles or surgical equipment. Symptoms of Theileriosis are similar to those of Anaplasmosis; however, there is no approved treatment for Theileriosis in the United States. Because bovine Theileriosis and Asian Longhorned ticks are new to the United States, more research is needed to combat both the tick and disease.

Objective: The objective of this research is to determine the prevalence of the Asian Longhorned tick and *Theileria orientalis* in beef cattle throughout the state of Arkansas.

Study Description: Surveillance efforts of the Asian Longhorned tick and Theileriosis have occurred through tick collections on cattle and the environment and by collecting blood from symptomatic cattle and random sampling from herds showing few or no symptoms. The environment is sampled using a dragging technique, where a sheet is moved along areas of a pasture with suspected high tick populations. Ticks were collected from different areas of cattle, including the head, ears, brisket, belly, udder, and tailhead. All ticks collected from the environment and cattle were transported to the University of Arkansas for identification. Blood was collected using jugular venipuncture and transported to the University of Arkansas laboratory for determination of the *Theileria orientalis* pathogen. Producers are notified if the Asian Longhorned tick was present in the environmental drags or found on cattle, and of a percentage of the animals testing positive for Theileriosis.

Results: The Asian Longhorned tick has been found in 10 counties in Arkansas and are very likely established in other counties. During periods of stress, symptomatic cows have been seen frequently during calving season and high infection rates have been observed in cows that have aborted. Calves are showing symptoms such as loss of appetite, anemia, lethargy, and poor weight gain. *Theileria orientalis* Ikeda has been found in 15 counties, with infection rates ranging from 0 to 100% in sampled herds. *Theileria orientalis* Chitose has been found in 7 counties in Arkansas.





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Effects of Red Seaweed Supplementation on Methane Emissions in Beef Cattle

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Introduction: Cattle on forage accounts for 87% of methane (CH₄) contribution to beef production. Supplementation of red seaweed (*Asparagopsis* spp.) has been shown to reduce CH₄ production by up to 80%. These previous studies supplemented red seaweed daily; however, in forage systems, supplements are often offered every 3-4 days. If red seaweed can be effective when supplemented infrequently, it may offer a practical method to improve the environmental sustainability of beef production.

Objective: The objective of this experiment was to evaluate the frequency of red seaweed supplementation on methane (CH₄) emissions in beef cattle fed a forage-based diet.

Study Description: Eight crossbred beef steers were housed in a climate-controlled room and fed a controlled amount of a forage-based diet (76% fescue hay, 22% wet distillers grains, 2% vitamins and minerals). Steers were supplemented with a red seaweed pellet at either 0 g (control), 60 g daily, 60 g every 2 days, or 120 g every 2 days. Measures of greenhouse gas emissions were collected via an open circuit respiration calorimeter.

Results: Supplementation at 60g daily and 120g every other day decreased CH₄ production by 83% and 77% respectively compared to the control. However, there was no decrease in CH₄ production when steers were supplemented at 60g every other day. Red seaweed supplementation had no effect on dry matter intake (DMI).

Table 1. Effects of *Asparagopsis* spp. supplementation on greenhouse gas emissions and dry matter intake for beef steers fed a forage-based diet.

Item ¹	Control	60g/d	60g/2d	120g/2d	P-Value
CH ₄ , g/d	75.5 ^a	12.8 ^b	71.2 ^a	17.4 ^b	<0.01
CO ₂ , g/d	2910 ^a	3096 ^{bc}	3174 ^b	3026 ^c	<0.01
DMI, lbs/d	11.95	12.41	12.35	12.24	0.14

¹DMI = Dry matter intake, CH₄ = Methane, CO₂ = Carbon dioxide
^{a,b,c}Means differ within row ($P < 0.05$)

The Bottom Line: Supplementation of red seaweed every other day was effective at reducing CH₄ emissions in forage fed cattle with no negative impact on intake, as long as supplementation was provided to average 60 g/d. These findings indicate that infrequent supplementation of red seaweed has the potential to improve environmental sustainability of forage beef production.

