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Economic Losses from Bred Feedlot Heifers

Eric A. DeVuyst, Professor and Rainbolt Chair, Agricultural Economics

Fed heifers comprise a significant percent of US fed cattle production. In 2022 and 2023, heifers and cows were 42% of US harvested cattle. Pregnant finishing heifers are known to have less desirable biological and economic outcomes than open heifers. Edwards and Laudart (1984) reported pregnancy in heifer lots ranged from 3% to 20%.

Two primary concerns associated with pregnant feedlot heifers are poor performance relative to open heifers and dystocia if pregnancy is not aborted. Weibe et al. (2023) reported aborted heifers gained 0.4 pounds less per day for the first 72 days on feed compared to open heifers. Edwards and Laudert (1984) showed average daily gain reduction was larger the later in pregnancy heifers were aborted. Heifers aborted at 120 days or less had an ADG of 1.98 pounds. Those aborted after 120 days had an ADG of 1.69 pounds. Bishop et al. (2003) reported that heifers bred 60 days before pregnancy termination were lighter at slaughter with lower dressing percentage than open heifers fed for the same length of time.

While there appears to be little published about the costs associated with dystocia in fed heifers, anecdotal evidence suggests that these damages can be large. Heifers bred at a young age and light weight may have significant calving difficulties that require assistance from feedlot staff or a c-section by a veterinarian. Further, there is a probability of death loss or substantially lower carcass value from a heiferette.

The returns from feeding heifers also show the negative impact of pregnancy. Jim et al. (1991) reported returns from aborted fed heifers earned CA\$40 less per head than open heifers while pregnant heifers earned CA\$66 less per head than open heifers.

Buhman et al. (2003) reported even larger loss from finishing pregnant heifers. Open and aborted heifers returned \$100 to \$200 more than pregnant heifers.

Given that heifers comprise a significant percent of beef cattle slaughter, pregnant heifers entering feedlots impose significant economic losses to the beef sector. For cow-calf producers, early castration of bull calves is critical to reducing feeder heifer pregnancy rates. We occasionally hear auctioneers say that a lot of heifers is guaranteed open and the seller will buy back any pregnant heifers. This implies there is a premium from the guarantee. Good management practices that improve the value of steer calves (early castration) can also have positive impacts on heifer calves' value.

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Herd Bull Investment Calculator

Roger Sahs, Associate Extension Specialist, Agricultural Economics


In most cases, the decision to purchase a herd bull relates to a capital investment that is expected to pay out over a productive life ranging from 3 to 5 years. While the purchase price for a bull may seem expensive even for a commercial run-of-the-mill one, an investment in a higher priced bull can contribute to improved production of market-preferred calves and higher weaning weights. Thus the investment may be justified, particularly when viewed in relation to the number of calves the bull can sire over his useful life. And in many cases, the salvage value (the net sales value when the bull is culled) helps offset a substantial portion of bull purchase cost which reduces the total depreciation cost of a bull.

The Herd Bull Investment Calculator helps producers estimate the cost of owning a bull with respect to both cost and production. Annual bull cost is calculated and prorated on a: 1) per cow basis, 2) per calf weaned basis and 3) on a hundredweight (cwt.) of per calf weaned basis. This decision support aid also provides information on the change in bull cost per cow depending on the number of cows serviced along with the change in weaning weight required to pay for a higher priced bull. This provides insight into what the market

would have to pay to justify paying more for a herd bull that could produce a more marketable calf. Keep in mind that this analysis does not address any genetic improvements of replacement heifers.

The example shown here illustrates a recent calculation showing that if the user believes weaned calf prices will bring around \$3 per pound during the bull's useful life and the total costs of keeping a \$4500 breeding bull runs \$1367 per year, then the annual bull cost is \$45.57 per exposed cow or \$9.38 per cwt. on calf weaned basis. These are useful comparisons if leasing bulls and artificial insemination are under consideration. Current calf prices may not remain as high as projected over the next four years in the illustration and the user should also allow for other risk realities like a lower weaned calf crop percentages or replacing feed equipment damaged by a restless bull. Tailor the numbers to fit your situation!

This Herd Bull Investment Calculator and additional OSU software tools may be accessed online at: <https://extension.okstate.edu/programs/beef-extension/calculators/>

Bull Investment Cost Analysis				
Oklahoma State University		OKLAHOMA COOPERATIVE EXTENSION SERVICE		
Originally developed by James McGrann, Professor Emeritus, Texas A&M University and Christy Waggoner, Former Programmer, Texas A&M University 2012 update by Damona Doye and Roger Sahs, Oklahoma State University, and Lawrence Falconer, Mississippi State University				
Purchase Price of Bull	\$4,500			
Useful Life (Years)	4			
Bull Salvage Value	1,700	\$/cwt	\$/Head	
Interest Rate Used for Opportunity Cost	4.0	%		
Average Investment for Bull			\$3,270	
Cows Exposed to Bull Annually	30			
Weaned Calf Crop %	90.0	%		
Average Weaning Weight	540	Lb.		
Weaned Calf Price	\$300	\$/cwt		
Calves Weaned Per Year	27			
Calves Weaned During Useful Life of Bull	108			
Pounds Weaned per Exposed Female	486	Lb.	\$1,620.00	
Operating Cost Item	Annual Bull Cost		Annual Bull Cost per Cow Exposed	Annual Bull Cost per Calf Weaned
Grazing and Supplemental Feed	\$525.00		\$17.50	\$19.44
Veterinary Medicine	\$40.00		\$1.33	\$1.48
Other Cost	\$0.00		\$0.00	\$0.00
Annual Interest on 1/2 of Operating Cost	\$11.30		\$0.38	\$0.42
Annual Operating Cost	\$576.30		\$19.21	\$21.34
Ownership Cost				
Depreciation	\$615.00		\$20.50	\$22.78
Average Annual Interest Cost*	\$130.80		\$4.36	\$4.84
Death Loss (% of Purchase Cost)	1.0	%	\$1.50	\$1.67
Annual Ownership Cost	\$790.80		\$26.36	\$29.29
Annual Total Cost	\$1,367.10		\$45.57	\$50.63
			\$9.38	

Ranch/Farm Injuries

Barry Whitworth, DVM, MPH, Senior Extension Specialist, Department of Animal & Food Sciences

In January, I attended the Oklahoma Veterinary Conference. While waiting for one of the sessions to start, a classmate of mine made the comment of how many of the attendees walk with a limp, used a cane, and/or have damaged hands. We all agreed that working with animals is hard on the body. In general, anything associated with farming and ranching is dangerous.

Most farmers and ranchers know that agriculture is a dangerous occupation. According to United States Bureau of Statistics, workers involved in agriculture, forestry, and fishing had the highest occupational fatality rate in 2022. The fatality rate of 23.5 per 100,000 full-time equivalent (FTE) workers for this group is much higher when compared to the overall occupation fatality rate of 3.7 per 100,000 FTE. Most of the agriculture related fatalities are associated with transportation such as tractor overturns and vehicle crashes, but a fair number involve livestock.

Livestock accounts for a significant amount of human injury and deaths. A survey of seven states in the central United States (US) found livestock were a frequent cause of injury. One survey found cattle accounted for almost one third of the injuries. In another survey, cattle were responsible for 36% of the fatalities. With their unpredictability and enormous power, bulls can be extremely dangerous. One study reported 261 attacks on people with 149 reported as fatalities and 112 as injuries.

Most victims of cattle incidents are struck, trampled, gored, and/or kicked. The most common types of injuries are contusions, fractures, and lacerations involving the lower and upper extremities. More severe injuries are related to head trauma, internal damage, and crushing injuries.

Many factors play a part in causing injuries and fatalities. One survey found that the age of the victim was significant. Groups with younger people were at higher risk of injury when compared to older ranchers. This may be due to human error and overconfidence of the handler as was pointed out in one report as a cause of injury and death. However, medical conditions such as hearing loss and arthritis, which are more common in older people, can play a role in being injured. These conditions may restrict a person's ability to move out of danger or hear activities that may warn them to move. This relates to another reported risk factor of individuals working alone. It is reported that one third of the fatalities occur when no one else is present. Another interesting fact associated

with fatalities is that one third of the deaths were caused by animals that had previously shown aggressive behavior. It is wise to cull aggressive animals.

Another factor to consider is facilities. Several studies indicated that cattle equipment, housing, and working facilities contributed to injuries. This was especially important in bull incidents. Unfortunately, over 40% of cattlemen in one survey reported that they do not think their facilities are safe but hesitate to improve them. The reasons given include the cost of new equipment, satisfaction with the current facility, and lack of both time and knowledge on how to build a new facility.

Most if not all injuries and fatalities caused by livestock can be prevented. Livestock producers can reduce the risk of injury by studying animal behavior, by using proper handling techniques, and by using equipment correctly. Beef Quality Assurance as well as many other groups provide training in animal behavior and low stress cattle handling. Facilities and equipment are costly, but when designed and used correctly, accidents are reduced. Individuals need to protect themselves by wearing proper footwear, clothing, and head and eye protection. Also, many accidents happen when farmers and ranchers work alone. A partner present to keep watch may prevent an injury. Lastly, producers need to recognize their limits. When animals are involved, overconfidence will get someone hurt.

From a personal standpoint, I have had my share of incidents. I have been bitten, scratched, clawed, trampled, tossed around, mashed, and crushed by a variety of animals. All of the incidents were the result of overconfidence, human error, lack of knowledge, and poor equipment and facilities. My life's experiences are the same as many other farmers and ranchers. We all have one life to live, so we all need to take better care of ourselves.

For additional information on livestock safety, producers should visit their Oklahoma State University County Extension Agriculture Educator.

References available on request.

Mineral Balance for the Breeding Herd

David Lalman,, Professor & Extension Beef Cattle Specialists Animal & Food Sciences

Grazing cattle generally benefit from a mineral supplementation program. The problem is there are hundreds of products on the market intended to meet this need. How do you know if a product is a good match for your forage resources and your management system? Are there products available that deliver a complementary profile of vitamins and minerals at a lower cost?

Chief among the sources of uncertainty is the dynamic nature of forage vitamin and mineral concentration and the moving target of the cows' requirements as she progresses through the stages of production. Obviously, the mineral program does not need to produce precise balance each month, which is just about impossible to achieve anyway. Nevertheless, a simple mineral balance exercise or audit should be helpful to a) give you some confidence in the product you are using, b) reveal an obvious need for a change, and c) allow one to simultaneously compare cost and "fit" among different products.

A mineral balance exercise involves developing a simple, consistent record keeping system to track forage mineral composition and your cow herds' mineral consumption pattern during the same time of year. With this information, you can use a nutrition evaluation (computer software) program to project deficiencies or excesses. You will need an idea of forage mineral concentration, an estimate of forage intake, a current estimate of average daily mineral supplement consumption, and the mineral product's composition from the label. Most beef cattle

nutrition evaluation programs provide an estimate of forage intake and an estimate of daily mineral requirements based on the animals' weight and stage of production.

As an example, Figure 1 shows the nutritive balance table for 1,300 pound lactating beef cows grazing summer tallgrass prairie forage and consuming 3.2 ounces per day of a commercial mineral supplement containing 7.5% phosphorus. You can quickly view the status indicators in the right column to determine where major gaps

or excesses exist. In this example, these cows are projected to be about 6 grams per day short of sodium. Since salt contains 40% sodium, this suggests that these cows could use an additional 15 grams of salt or about 0.5 ounce per day. There are several excesses identified in this example. Most mineral balance exercises in the Southern Great Plains are going to reveal excessive iron due to high

forage concentration. The other revelation in this balance exercise is the considerable excess of manganese and selenium.

My conclusion for this mineral balance exercise is that a) this mineral supplement is a good complement to this forage source for this time of year and this stage of production, and b) one could blend about 10 to 15% salt with the mineral to better match the sodium requirement with intake and c) the selenium concentration in the commercial product could be reduced by about 50% if that were an option. It most definitely points out that there is no need to purchase mineral product containing a greater concentration of selenium.

Nutrient	Diet Concentration			Daily Amount		Status
	As Fed	DM	Required	DM	Required	
Diet DM	50%	-	-	-	-	-
TDN	32%	64%	-	19.7 lb	TDN:CP	7.11
ME, Mcal/lb	0.52	1.04	-	32.3 Mcal	-	-
NEm, Mcal/lb	0.33	0.65	-	20.1 Mcal	-	-
NEg, Mcal/lb	0.19	0.39	-	11.9 Mcal	-	-
NDF	35%	71%	-	4.5 lb	-	-
peNDF	32%	63%	7 - 20 Min	19.6 lb	7.0 pH	ADEQUATE
Crude Protein	4.5%	9.0%	-	2.77 lb	2.59 lb	ADEQUATE
Fat	1.5%	3.0%	-	0.92 lb	-	ADEQUATE
Calcium	0.19%	0.39%	0.24%	54.4 g	33.7 g	ADEQUATE
Phosphorus	0.10%	0.20%	0.19%	27.7 g	27.1 g	ADEQUATE
Sodium	0.03%	0.06%	0.10%	8.61 g	14.03 g	DEFICIENT
Potassium	0.63%	1.25%	0.60%	175.1 g	98.2 g	ADEQUATE
Magnesium	0.10%	0.21%	0.15%	28.8 g	28.1 g	ADEQUATE
Sulfur	0.08%	0.16%	0.15%	22.6 g	21.0 g	ADEQUATE
Cobalt ppm	0.14	0.28	.15 ppm	4.0 mg	2.1 mg	ADEQUATE
Copper ppm	7.86	15.7	10 ppm	220 mg	140 mg	ADEQUATE
Iron ppm, mg	118.58	236.4	50 ppm	3317 mg	701 mg	EXCESSIVE
Manganese ppm	65.32	130.2	40 ppm	1827 mg	561 mg	EXCESSIVE
Selenium ppm	0.19	0.38	.1 ppm	5.4 mg	1.4 mg	EXCESSIVE
Zinc ppm	26.07	52.0	30 ppm	729 mg	421 mg	ADEQUATE

Figure 1. Mineral balance for a lactating beef cow grazing summer tallgrass prairie forage.

Mineral Balance for the Breeding Herd (cont.)

Several commercial nutrition companies provide services to conduct these balance exercises and follow up by recommending or manufacturing mineral formulations customized to your operation's needs. In recent years, commercial livestock nutrition laboratories have incorporated mineral composition analytical services. For example, our lab here at OSU charges \$12 per sample to get macro and micro minerals. Depending on your level of concern or interest, one might get started by conducting a winter feeding and summer grazing balance. A more ambitious approach might be to collect "hand-plucked" samples from one or more pastures each month. The idea of the hand-plucking method is to select only plants and parts of plants that you believe to represent what your cattle are currently grazing.

For the example given above, I used the OSU Cowculator nutrition evaluation program ([OSU Cowculator](#)). Similar programs are available through animal sci-

ence departments at the University of Georgia ([UGA Basic Balancer](#)), Iowa State University ([BRaNDS](#)), and University of Arkansas ([Mineral Profile Evaluator](#)).

These are great tools to simplify this process. The feed library allows one to enter their own forage nutritive values and mineral supplement products/formulations. The "Balance" page provides guidance to estimate daily forage consumption and then a place to input the amount of mineral the cows are expected to consume.

Consider collecting forage mineral composition and mineral supplement consumption data several years in a row to get a clear view of your operations' patterns over time. Using that valuable information, you can get a good idea of how well a commercial or custom mineral product matches your forage resource to meet your cow herd's needs.

The Value of Reputation

Kellie Curry Raper, Professor and Livestock Marketing Specialist, Agricultural Economics

"Reputation cattle" is a term you'll hear often when cattle prices are discussed. In a survey of Oklahoma cattle buyers, 64% said that seller reputation played a part in their last feeder calf purchasing decision (Boline 2015). What is "reputation" in the cattle market? How do you build it? And what is it worth?

What is it?

Reputation has several puzzle pieces that come together to create the whole picture. The biggest puzzle piece is how cattle perform for the buyer. If a buyer has a positive experience with a seller's cattle, that buyer is more likely to raise a hand to bid the next time that seller's cattle come through the ring and may be willing to pay a premium for those cattle. That seller is building a positive reputation with the buyer – and other buyers – for cattle performance. If the calves were a train wreck, trust that buyers have a very long memory. Cattle performance encompasses a lot of things, including gains, health, and handling ease to name a few – and different cattle buyers will value certain attributes more than others.

How do you build it?

What you do today influences the reputation of your cattle tomorrow. A positive reputation for quality cattle is built over time by marketing cattle that perform well for buyers' needs. That performance is linked to cattle genetics, herd management protocols, and calf management practices, among others. Work toward improving the overall quality of your cattle and toward implementing important health management protocols that strengthen immune systems of calves moving through the system.

Cattle buyers are very good at their craft and are particularly good at judging the visible attributes of cattle and what that indicates about potential. However, cattle also have attributes that are not easily observed. These attributes are known as credence attributes. The buyer is left to decide whether attributes that may be announced but are not physically observable are present. When sellers have established their reputation, buyers see management claims as more credible.

Some of you believe that you have to be a large operation to establish a positive reputation, even if you are "doing all the right things." If you are a smaller operation and feel the struggle of establishing a reputation, there is

The Value of Reputation (cont.)

evidence that third-party certification of the preconditioning bundle of calf management practices at least partially substitutes for an established reputation when it comes to regarding market value.

What is it worth?

While the market value of seller reputation in cattle markets is considered to be a key component of the price paid by the buyer, it is elusive to measure in standard auction data. Bolin (2016) interviewed cattle buyers on-site at livestock auctions and found that reputation does matter, but also that third-party verification can act as a proxy for reputation (Figure 1). Cattle buyers were willing to pay similar premiums, on average, for certified cattle with an unknown reputation (\$2.52/cwt) and uncertified cattle with a positive reputation (\$2.86/cwt). Certified cattle from a reputation seller averaged \$10.42/cwt in stated premiums. It is also important to note that negative reputations were discounted more heavily than positive reputations were rewarded and that even certified cattle from a seller with a negative reputation were still

discounted quite heavily. For cattle with an unknown reputation, only 2% would not consider those cattle if certified, but if cattle were uncertified, 9% of buyers would not consider purchasing them. However, 25% of buyers would not consider purchasing cattle with a negative reputation, regardless of certification.

Cattle buyers talk, so reputation will also be built around the coffee pot at the livestock market café or the feedyard. Whenever possible, get feedback from buyers about cattle they have purchased from you. If things went well, figure out what you did right. If things went south, figure out what needs corrected. Remember that reputations can be positive or negative, so take care that you are making management decisions that continue to build up the positive reputation of your cattle.

Bolin, Amy Ranae. 2016. *Essays on Beef Calf Management Practices and the Market Value of Seller Reputation*. M.S. Thesis, Oklahoma State University.

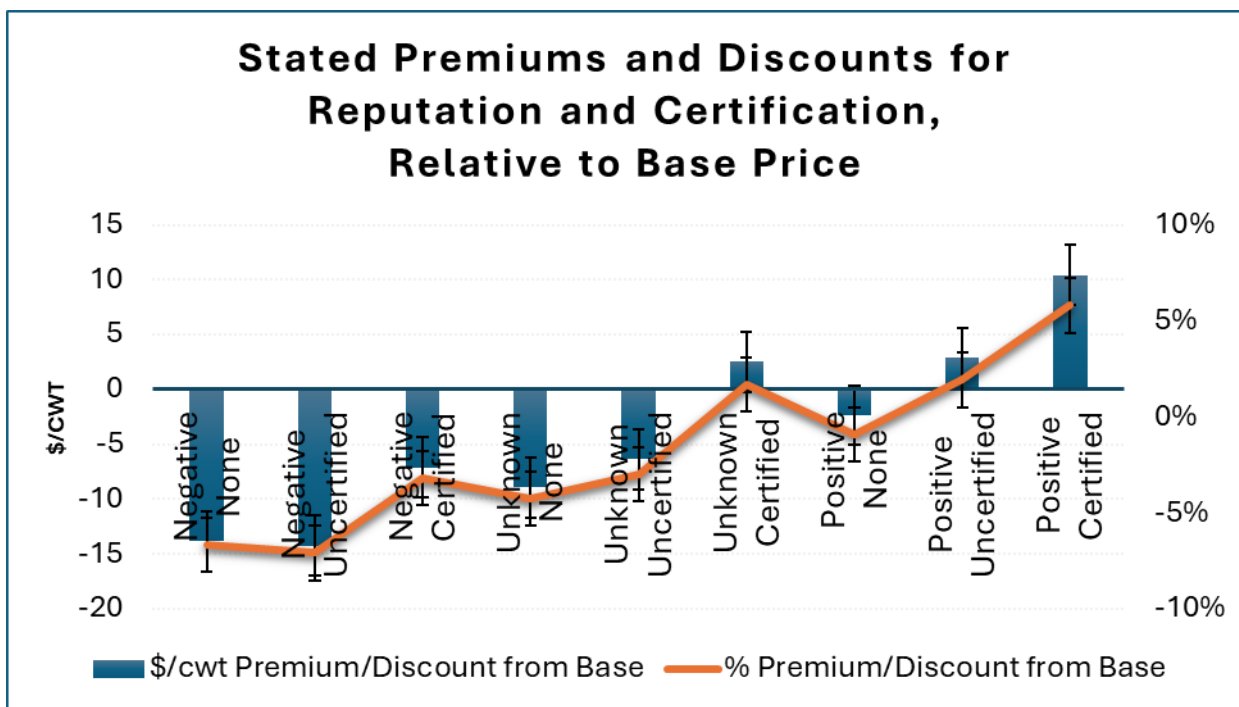


Figure 1. Cattle Buyer Willingness to Pay Based on Seller Reputation.

Reading Cattle Market Headlines

Derrell S. Peel, OSU Extension Livestock Marketing Specialist, Agricultural Economics

Cattle producers need to understand cattle market conditions and corresponding market signals in order to determine how they can best respond to the market and take advantage of the current situation. Market conditions lead to market signals, (i.e. prices) that encourage producers to respond to the needs of the market.

In 2024, cattle markets are characterized by reduced cattle inventories as a result of drought-forced, mostly unplanned, liquidation that resulted in a 2.62 million head decrease in the beef cow herd in 2021-2023. This follows limited cyclical herd liquidation in 2019 and 2020. In total, the beef cow herd is down 3.47 million head since the cycle peak in 2019. There are strong indications that the

cattle industry is smaller than is needed (relative to market demands). The beef cow herd is likely to continue to liquidate in 2024. Concurrently with herd liquidation is continued reduction in the inventory of beef replacement heifers.

The 2024 beef replacement heifer total was down a total of 1.50 million head since the recent peak in 2017, with a reduction of nearly one million head in just the last three years. The January 2024 beef replacement heifer inventory was the smallest since 1950.

The smaller cow herd inventory leads to a smaller calf crop. The total U.S. calf crop has decreased 2.72 million head since the cyclical peak in 2018, with 70 percent of that decrease in the last three years. The 2024 calf crop is projected to be nearly nine percent smaller than the peak calf crop in 2018. Eventually, smaller calf crops lead to smaller feeder supplies, smaller feedlot production and reduced beef production. Total beef production decreased from the record 2022 level, by 4.7 percent in 2023 and is projected to decrease another 4.0-4.5 percent in 2024 and 2025. Average feedlot inventories are

down about 2.2 percent from the peak in 2022 but are expected to decrease more sharply in the coming months.

The market response to these conditions is shown in Figure 1. All cattle prices have increased with calf prices rising faster and more than feeder cattle. Feeder cattle prices have risen faster and more than fed cattle prices. All cattle prices have reached record levels in recent months. Producers can think of cattle prices as the market headlines that are telling them what to do.

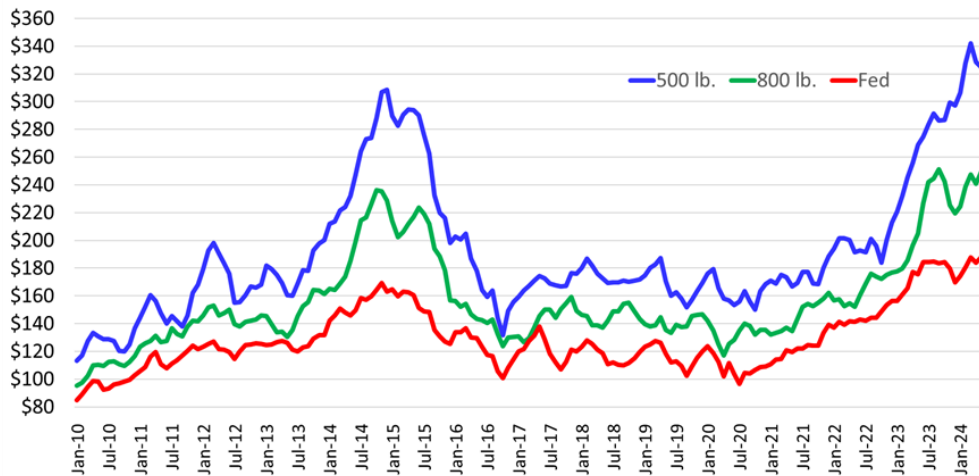
The biggest market headline today is high calf prices telling producers to rebuild the cow herd and expand calf production. Calf prices are expected to move higher as incentives build to retain heifers and the process of heifer

retention squeezes feeder cattle supplies. High calf prices now and the prospect of high calf prices for 2-4 more years is encouraging cow-calf producers to expand calf production.

The second general in-

centive in cattle markets is to move cattle through the system more intensively. In particular, this means less incentives for slower production processes such as stockers. With reduced inventories, feedlots will bid aggressively for tighter feeder cattle supplies. With feedlot cost of gain declining, feedlot will claim more of available feeder supplies. Stocker producers are increasingly limited to working with very lightweight animals and turning them more quickly. For cow-calf producers, this means there is less incentive for retaining calves beyond weaning. Feedlots will continue to scramble for available feeder supplies, a challenge that will grow as heifer retention increases in the coming months. Cattle prices are expected to average higher for the remainder of the year and in 2025 at least as cattle supply dynamics continue to tighten.

Figure 1. Fed and Feeder Steer Prices
Oklahoma Combined Auction and 5-Mkt, Monthly, \$/cwt.



Master Cattleman Graduates

Master Cattleman Graduates – We are working to keep our contact information for you current! You can help us by taking a few minutes to send an email to mastercattleman@okstate.edu with:

- Name (Also include your ranch name if applicable)
- Mailing Address
- Home County
- Email address

Thank you!



Upcoming Events!

- **The 2024 Oklahoma Women in Ag and Small Business Conference** will be held August 1, 2024 at the Hilton Garden Inn & Conference Center in Edmond! You can learn more about the conference and register at <https://extension.okstate.edu/events/women-in-ag/>. Visit the Oklahoma Women in Agriculture and Small Business Facebook page for more information on speakers and topics, including the OSU calving simulator. Early registration is \$65. After July 22nd, registration increases to \$100.
- **The 2024 Rural Economic Outlook Conference** will be held at the ConocoPhillips Alumni Center on Wednesday, October 16, 2024. The excellent lineup of speakers includes Kenny Burdine, Extension Professor in Livestock Economics, University of Kentucky, and Randy Daniels, Chief Risk Officer, Triangle Insurance. The registration fee is \$50.00 until October 9. After October 9 registration will be \$75, which includes breakfast, lunch and breaks on Wednesday. More information and registration can be found at https://secure.touchnet.com/C20271_ustores/web/product_detail.jsp?PRODUCTID=2522

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