Campbell County Extension Service

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The FARMACY

"Agriculture is our wisest pursuit because it will in the end contribute most to real wealth, good morals and happiness"

- Thomas Jefferson -

Agriculture & Natural Resources Newsletter

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Inside this Issue:

After A Big Rain: N Loss, Erosion, and Other Things

John Grove[1], Chris Teutsch[1], Edwin Ritchey[1], Brad Lee[1], Glynn Beck[2]

As we write this article, it is still raining – towards an unknown but large amount of rainfall (Fig.1). Credit for stimulating this piece goes to Andy Mills (Meade County ANR agent) and Chris Teutsch, who started the conversation around Andy's question about potential loss of fertilizer nitrogen (N) from recently fertilized hay and pasture fields. We hope to help folks understand what we do and don't know about what happens in these unusual situations. Three basic scenarios; fertilized grass (hay and pasture), fertilized wheat, and fertilized fields intended for corn are discussed. The story has been expanded a bit to cover some other questions that are asked after events like this.

Factors impacting N loss in grasslands. With heavy rain like this, fertilizer N loss from fertilized grass sods depends on several factors: 1) the length of time between the rainfall event and the fertilization event; 2) the ability of the sod to take up the applied N (is sod actively growing and dense enough both above and belowground (and rooted deep enough belowground); and 3) the amount of N applied. The Kentucky grasslands that have been fertilized are made up of cool-season grasses that take up nutrients at air/soil temps above 40° F and are actively growing at 55° F. Stronger (thicker, denser, and deep rooted) sods took up more fertilizer N each day before this heavy rain began. That said, there will be a larger amount of unused fertilizer N when the number of days between fertilization and rainfall were fewer and/or with a larger rate of N application relative to N uptake by the grass. More N will be lost when 80 lb N/acre was applied 4 days before this rainy period to an overgrazed pasture that is thin above ground and not deeply rooted than when 50 lb N/acre was applied 12 days ago to a hay field with a thick stand and well-developed root system. As the crop is perennial, a grassland field's N nutritional status can be adjusted later in the season, in anticipation of future harvests.

Factors impacting N loss in wheat fields. Kentucky wheat fields are actively growing, and most have received the full amount of fertilizer N intended for this season. The same three factors: length of time between rainfall and N fertilization; ability of the growing wheat to take up the N fertilizer; and the amount of N applied all impact N loss. Whether the was applied in a single dose or split applied is another factor. Wheat has been growing for the past 6 to 7 weeks, taking up both soil and fertilizer N. Better stands with more tillers and more tiller development will have acquired more N – especially if planted earlier and fertilizer N was split into two applications. Fertility programs were essentially complete by 15 March in many Kentucky wheat fields. Still, more N probably remains in the soil, and N loss potential is greater, when 120 lb N/acre was applied on 15 March to a wheat field planted on 15 November than when 60 lb N/acre was applied on both 20 February and 15 March to a wheat field planted on 15 October. The latter likely had greater tiller numbers, tiller growth and rooting depth. At this stage of Kentucky wheat crop growth and development, much of any yield loss will be due to the duration of saturated soil conditions/ponding (low oxygen) and not due to low soil N status. Wheat has taken up much of the fertilizer N (that it could take up). A yield benefit to additional N is less likely. Additional N applied as these soil conditions improve to support field traffic tis more likely to improve grain protein levels than yield.

Factors impacting N loss in fields intended for corn. At this time, N losses are probably more important in N fertilized fields intended for corn than in wheat, hay or pasture fields. Very little corn has been planted. There may be some living plant cover (either weeds or cover crops) that could take up fertilizer N in these fields, and the same considerations as indicated for a living grass sod would apply, though the root system under most winter

Figure 1. Ponded water in a Caldwell County wheat field. Photo courtesy of Edwin Ritchey.

Figure 2. Ponded water in a Caldwell County row-crop field where the cover crop has been terminated. Photo courtesy of Edwin Ritchey.

weeds and cover crops tends to be less extensive/deep. However, in western Kentucky many weeds and cover crops have already been terminated with herbicide and pre-plant N fertilization rates can be large (Fig. 2). The terminated plant cover remains important to controlling another big driver of N loss from these corn fields – soil erosion. Any surface tillage, even vertical tillage, loosens the soil, breaks up residues and accelerates both soil erosion and crusting (which causes even lower infiltration and more runoff). Even if surface applied fertilizer has dissolved and moved into soil aggregates, out of the reach of leaching and before denitrification has started, heavy rainfall can exceed soil infiltration rates, causing runoff to erode nutrient-rich topsoil.

Runoff and erosion drive N losses in fields intended for corn. At present, runoff and eroded soil nutrient losses are less likely in grassland and wheat fields because the soil is covered with living plants. Runoff water from small watersheds located in Kentucky row-crop farm fields is being collected and analyzed for nutrient amounts and forms (Table 1). The particulate/organic forms of these nutrients are entirely due to erosion of mineral particles and organic matter while the dissolved nutrients are more directly derived from fertilizers. From 40 to 50% of runoff-borne N and P results from erosion. Potassium (K) loss patterns would likely be similar.

Remaining fertilizer N susceptible to leaching and denitrification. The fertilizer N that remains is vulnerable to either leaching or denitrification. Those two modes of N loss are driven by other factors. These include the: 1) amount and rate of rainfall; 2) soil infiltration rate and duration; 3) soil drainage; 4) soil texture and structure; and again 5) length of time between the rainfall and fertilization events. Nitrogen fertilizers are very soluble and quickly dissolve into the pore water contained in moist soils - at this time of the year all Kentucky soils are moist. The dissolved N, whether urea (urea is soluble in water – is used in UAN: urea-ammonium nitrate solutions) or nitrate-N, diffuses throughout the pore water found both in and outside soil aggregates. The longer it is between N application and heavy rainfall, the more time for diffusion to carry dissolved N into aggregates.

Leaching losses of N. When the soil infiltration rate is above average and the rainfall rate and/or rainfall quantity are high, the moving percolating water strips away (leaches) dissolved N that lies in pore water outside the soil aggregates. The percolating water moves especially well through larger pores (macropores) in well and moderately well drained soils. But the pore water found inside the aggregates is 'bypassed' by the macropore flow and the dissolved N therein is not leached. Tile drainage

(continued on next page)

Table 1. Nitrogen (N) and phosphorus (P) losses over one crop cycle (2 years) from small watersheds under corn/full season soybean or corn/wheat/double crop soybean rotations.[3]

Cropping System	Monitoring Stations	Nutrient	Total Loss	Particulate or Organic	Dissolved Inorganic
			lb/acre	--- % of Total Loss ---	
Corn – Soybean	10	N	38 ± 19	53	47
		P	9 ± 4	44	56
Corn – Wheat – Soybean	8	N	36 ± 21	41	59
		P	6 ± 2	49	51

[3]Blue Water Farms on-farm project research results. Supported by five anonymous row-crop landowners/producers; USDA-NRCS-EQIP program; Kentucky Soybean Promotion Board; Kentucky Agricultural Development Board; University of Kentucky Agricultural Experiment Station; and Kentucky Geological Survey.

After A Big Rain: N Loss, Erosion, and Other Things

(continued from page 3)

can increase macropore flow, soil water percolation rate and nitrate-N leaching, especially when fertilizer N application was only a few days before the heavy rain.

Denitrification N loss more important than leaching N loss in Kentucky. Denitrification is the biological conversion of nitrate-N to dinitrogen (N2) or nitrous oxide (N2O), both gases. Although leaching is more immediate than denitrification because the latter is biologically driven and takes 2-3 days to get going, in Kentucky denitrification N losses are more important because of the large number of acres with restrictive layers (e.g. fragipans) and poor drainage (both somewhat poorly and poorly drained) that impede water percolation, causing soil saturation and water ponding.

Nitrogen source can impact N loss. Fertilizer N source can impact N loss potential after heavy rain (Table 2). Both leaching and denitrification losses start with nitrate-N. Applied UAN and ammonium nitrate are 25 and 50% nitrate-N at the outset, respectively, and losses can be more immediate than if urea was used. Injected anhydrous ammonia suppresses soil biology and biological N transformation in the injection volume for a time, remaining longer as ammonium-N. Use of a nitrification inhibitor (nitrapyrin/N Serve, dicyandiamide/DCD or pronitridine/Centuro) further delays nitrate-N formation and N loss. Well and moderately well drained (including tile drained) upland soils wet from a series of rains probably are more likely to have some leaching loss - will not experience much denitrification prior to draining. Soil in lower landscape positions that stays saturated longer will likely lose N to denitrification. Losses can be calculated by estimating 3 to 4 percent loss of fertilizer NO3-N for each day of saturation.

Table 2. Proportion of applied fertilizer N converted to nitrate-N at 0, 3 and 6 weeks after application.[4]

Fertilizer N Source	-- Weeks After Fertilizer N Application --		
	0	3	6
	-- % of fertilizer N as nitrate-N --		
Anhydrous ammonia (AA, 82-0-0)	0	20	65
AA with nitrification inhibitor	0	10	50
Urea (46-0-0)	0	50	75
Urea with nitrification inhibitor	0	30	70
UAN[5] (28, 30, 32-0-0)	25	60	80
Ammonium Nitrate (34-0-0)	50	80	90

[4]Table data compiled by Lloyd Murdock.

[5]UAN = urea-ammonium nitrate solutions.

An example situation: Corn grower has applied 200 lb N/acre as urea to a field made up of somewhat poorly drained soils 3 weeks before the rain began. Because of the series of heavy rains, the field was saturated for ten days. How much N was lost? Note: It is common that only portions of the field are saturated, and that the ponded field area decreases with time. This means that this calculation could be done to represent the best case, average, or worst case for the field.

Step 1: Calculate the amount of applied N that was in the nitrate-N form when saturation began. According to Table 2, 50% of the urea-N was in the nitrate-N form three weeks after application and: 200 lb N/acre x (50%/100%) = 100 lb nitrate-N/acre.

Step 2: Calculate the amount of N loss. Conservatively, only two days are needed for soil biology to begin the denitrification process, so the field denitrification losses occurred over the remaining eight days of saturation. Again, conservatively, assuming 4% was lost each day for eight days, then 32% of the nitrate-N would have been lost.

100 lb nitrate-N/acre x (32%/100%) = 32 lb nitrate-N/acre was lost. 200 – 32 = 168 lb fertilizer N/acre would remain. *The N loss calculated in this example is not as high as many people would assume.*

Soil nitrate testing. A soil nitrate-N test can help verify the calculated estimate of nitrate-N remaining in the field. Each soil sample should consist of about 15 cores taken to a depth of 12 inches, hand crushed and well mixed before filling a soil sample bag with the appropriate amount of soil and shipping immediately to a soil test lab (several labs, including Waters Ag Labs in Owensboro and Waypoint Analytical in Memphis, perform the test). Separate samples should be taken for upper and lower landscape positions, for well, moderately well, somewhat poorly and poorly drained soils, for fragipan and no-fragipan soils; and/or for undrained and tile drained field areas. Test results can be used to decide whether more N, and if yes, how much, is needed.

Figure 3. Soil erosion in a no-till field covered with residue but lacking a good cover crop. Photo courtesy of Brad Lee.

Other things of note. Unattached crop residue tends to float, and wind will push it across ponded waters, leaving piles of residue at the water's edge as it drains away. Minimize loose residue with appropriate combine settings during harvest and by avoiding post-harvest residue mowing or tillage. Implementing these BMPs helps maintain a larger proportion of soil-attached residues that serve to limit floating residue movement and piling if ponded water is shallow. Figure 3 illustrates the consequences of depending on crop residue for erosion control.

Ending on the positive, soil compaction due to the weight of water over soil during ponding is truly not a problem. Soil scientists get asked about this regularly. Soil pores are filled with water (soil air is expelled) as ponding begins and water-filled soil can't be further compressed by the weight of water above.

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Will or trust: Which is better for your farm?

Allison Lynch, Farm Progress

Estate planning is crucial for farmers. Here's what to consider when determining the best plan for transferring your operation.

START NOW: Begin having conversations about your farm's succession plan now so you are not caught empty-handed without any direction. Two options to consider when deciding how to pass down your land and belongings are a will or a trust. Discover which works best for you. Dennis Lund

When the farm transition planning conversation arises, there can be a whole slew of terms and documents that make the process confusing. Don't allow yourself to get lost. Rather, understand the options available.

If you do not create an estate plan, Indiana has one in place that will be used for you. A probate estate would be opened to transfer property from the decedent to their heirs. This is not the ideal scenario, says Jacob Ahler, attorney and partner at Riley & Ahler Law in Rensselaer, Ind.

"You don't have control over where your assets go," Ahler says. He adds that it would be better to begin planning early and decide what specific agreement would match your operation's goals.

Will or trust

Simply put, two of the main options are a will or trust. A will lists your belongings and what should happen with them, but it goes through the court process. On the other hand, a trust stays private and allows you to include specific instructions for how your requests will be carried out.

Here are some items to consider when deciding between a will or a trust:

Family strife. In a family with lots of conflict, a will may be the best direction because it is filed with the court. You can select a supervised estate, which means that every transaction must be approved by the court. For example, if one of the heirs wants to sell the inherited land, it must be approved by the judge.

"If you have a family where your heirs are estranged or there's fighting in the family, a will is a really good document to make sure that is supervised and you don't have people taking advantage of the heirs, or depleting or embezzling estate assets," Ahler says.

Privacy. Because a will is filed with the court, anyone can have access to that information. If privacy is a priority, then a trust would be the better option. A trust is a private document that never gets filed with the court.

"You can administer your trust privately and generally much faster than a probate estate," Ahler adds.

Control over details. Preparing a trust allows you to place very specific instructions on how your estate and belongings will be passed down and managed. For example, you can name the successor trustee, select the person who will carry out your wishes and dictate who will manage your assets.

"That allows you to transfer ownership to your heirs or the next generation without having to go through the probate process," Ahler says.

Will requirements

If you opt to go the will route, there are some specific requirements to

make the document valid. It is more than simply writing down your wishes on paper.

"There's this belief out there that if you write down what you want and somebody notarizes it, that it's a will," Ahler adds. "It's not."

Here are the requirements for a valid will.

- must be in writing
- must be signed by the testator, who is the person creating the will
- testator must be at least 18 years old and of sound mind
- must be signed by two witnesses, in front of you and each other
- witnesses must know the document they are witnessing is your will
- witnesses must be disinterested in the will, meaning they will not benefit from the will

There is no right option when making a farm transition plan. Start the conversation early and know that some agreements will work better than others.

"There is not a one-size-fits-all option," Ahler says. "We draft a lot of wills, and we draft a lot of trusts. It all depends on what is best for your family."

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Taking a Systems Approach to Cow Size

Travis Mulliniks, Associate Professor of Beef Cattle Management / Department of Animal and Rangeland Sciences
Oregon State University

The carrying capacity of a ranch depends largely on the size the cows in its herd. Carefully consider how issues such as forage demand, stocking rate and weaning weight play off each other on your operation.

In the past 75 to 100 years, we have seen cow size go from belt-buckle cattle to hat-brim cattle. Much of this was done in efforts to increase income, and cow-calf producers have placed heavy selection pressure on growth traits to increase weaning and yearling weights. Since growth traits are highly heritable, retaining replacement females with increased growth potential has caused the cow size in herds in the U.S. to increase. Between 1975 and 2005, the average cow weight in the U.S. at slaughter increased from 1,050 to 1,350 pounds. Since 2005, cow size in the U.S. has probably pushed into the 1,400- to 1,500-pound range.

The increasing trend of larger cattle has implications for forage consumption, stocking rates and overall ranch profitability. This increase in cow size has led cow-calf producers to commonly comment, "I run fewer cows today than I used to on the same range," or, "My grazing days have decreased over the years," or, "We have had to increase feeding harvested feedstuffs." Some of these situations can stem from yearly changes in precipitation; however, due to increased selection for growth traits, today's cow herd has crept up to larger sizes, resulting in changes that need to be made at the ranch to carrying capacity and stocking rates.

Forage demand

Determining the correct carrying capacity is one of the most critical factors in ranch management. It determines the stocking rate a ranch can support sustainably without long-term degradation of forage resources. While factors such as climate (inter- and intra-annual precipitation), soil quality, grazing and pasture management play significant roles in carrying capacity, one often overlooked factor is cow size.

Larger cows have greater maintenance energy requirements and consume more forage than smaller cows. For instance, an 1,100-pound cow consuming 2.5% (on a dry matter basis) of her bodyweight would consume 27.5 pounds per day; whereas a 1,200-pound cow consuming the same 2.5% would consume 30 pounds of forage per day. Over the course of a year, this 100-pound difference would equate to 912.5 additional pounds of forage needed to support the increase in cow weight. As cow size increases, the number of cows a ranch can support on the same acreage decreases. Studies from the Southern Plains show that increasing cow size by 100 pounds increases feed cost by approximately $42 per cow to support the added forage intake or increased harvested forage feeding associated with larger cows.

Stocking rates

Stocking rate – the number of cows per acre over a period of time – is directly influenced by cow size. Stocking pastures with the right number of animals is one of the cornerstones of proper grazing management. Proper stocking depends on two factors: animal intake and pasture productivity. As discussed above, animal intake and weight go hand in hand. Methods such as animal unit (AU) that allow for a standardized unit for calculating forage demand and forage supply can help provide recommendations on stocking rate; however, an accurate adjustment in cow size is needed for proper grazing management. Ranchers managing larger cows must reduce their stocking rates to avoid overgrazing or increase pounds of harvested feeds to offset the decreased grazing capacity. If a ranch's carrying capacity is based on 1,100-pound cows and the herd size shifts to 1,400-pound cows, stocking rates must be adjusted downward, often leading to fewer total cows on the land.

Calf weaning weights

Larger cows generally produce larger calves, which can be advantageous in terms of weaning weights. Data from the Sandhills of Nebraska has shown that increasing cow size by 100 pounds increases calf weaning weight by 14 pounds. The ratio of calf weaning weight to cow weight has previously been used as a measure of the efficiency of cow size. Bigger cows do not always wean heavier calves proportionate to their body size. Calf weaning weight to cow weight ratio significantly declines as cow size increases. The smaller cow, therefore, produces a greater percentage of her bodyweight in calf, potentially leading to better efficiency while maintaining an ability to run more cows. To offset the increased forage intake and decreased carrying capacity in larger cows, larger cows must have the ability to pay for the bigger feed bill. Studies from the Southern Plains and Nebraska Sandhills have illustrated that smaller cows (around 1,000 pounds) weaning smaller calves are still more profitable than larger cows.

Drought and forage availability considerations

In drought conditions, larger cows are riskier because of their higher forage intake needs and increased nutrient requirements, which puts more pressure on limited forage resources. Larger cows require more feed to maintain body condition, support reproduction and sustain milk production. During drought or feed shortages, these increased demands can strain forage resources and raise production costs.

Economic considerations

Ranchers must balance the tradeoffs between larger cows and carrying capacity. While larger cows may produce heavier calves, the additional feed and lower stocking rates might reduce overall profitability. A smaller, more efficient cow herd may allow for more total weaned weight per acre, even if individual calves are lighter. Even in retained ownership enterprises, smaller cows have an advantage. Our data shows that progeny from smaller cows perform and grade relatively better than progeny from larger cows. Regardless of grid or cash liveweight pricing, cow-calf producers maximize the highest amount of profit by selecting smaller cows.

Finding the right balance

Optimizing cow size for a specific ranch requires a balance between cow efficiency, forage availability and economic returns. A driver of cow size at the ranch is the energetic inefficiency of beef production due to the high cost of body maintenance requirements. With that in mind, of the entire beef production system, the beef cow or cow herd is the most energetically demanding segment. For instance, 71% of the total dietary energy expenditure in beef production is used for maintenance, and 70% of that maintenance energy is required for the cow herd. Therefore, an overwhelming 50% of the total energy expended in producing beef is used for the maintenance of the cow. However, with genetic trends and selection for output traits, maintenance costs for the cow herd may have increased over time.

What are the criteria for the right cow size? Is it calf weaning weight and eventual slaughter weight, marketing endpoint, optimal ranch forage utilization, optimizing net returns for the cow-calf operation or a lower-risk production system? The answer is “yes” to all of the above, as they are all interrelated. Every decision we make on the ranch has a downstream impact. Therefore, as we make or have previously adjusted genetics, we need to consider the ramifications to all aspects of the ranch as an integrated approach.

Conclusion

Cow size plays a significant role in determining the carrying capacity of a ranch. While larger cows can produce heavier calves, their increased forage demand may reduce overall stocking rates and profitability. Ranchers must carefully evaluate the tradeoffs and select cow sizes that optimize forage use, reproductive efficiency, marketing endpoint and economic returns. By finding the right balance, producers can improve the sustainability and profitability of their operations.

“A 100-pound difference in cow bodyweight can equate to an increase of more than 900 pounds of forage required to maintain the cow throughout the year”

Be Aware of Frothly Bloat Risk in Spring Pastures

Dr. Michelle Arnold, DVM-Ruminant Extension Veterinarian (UKVDL)

Ruminant animals produce large volumes of gas through the normal fermentation process during forage digestion. This gas is predominantly belched up (eructated) as it passes through the gastrointestinal tract. If something interferes with gas escape from the rumen, pressure builds up and causes an obvious distension in the left flank of the abdomen, a condition known as "bloat" **(Figure 1).** The swollen rumen occupies a large amount of space within the abdomen, resulting in compression of the lungs and diaphragm which interferes with breathing and tissue oxygenation, obstruction of blood flow to vital organs, and potentially the rapid death of the animal. Bloat may be classified into one of two types, "free gas" or "frothy", with both types possible in cattle whether on pasture or in a confinement feedlot setting. Free gas bloat in pastured cattle is most often due to obstruction of the esophagus (choke) with rapid onset of bloat and death if not addressed quickly. Free gas bloat from choke can be relieved by passing a tube down the esophagus into the rumen, simultaneously clearing the esophageal obstruction and releasing the trapped gas. Frothy bloat, on the other hand, results when fermentation gases become trapped within a stable foam in the rumen (like the head of a beer) and the animal is no longer able to belch up the gas. Simply passing a tube into the rumen will not solve the problem because the froth prevents gas from leaving the pressurized rumen. For effective relief, anti-foaming agents must be delivered directly into the rumen to disperse the foam and allow the gases to escape.

Figure 1: Frothy bloat. From "Bloat in Cattle and Sheep" September 2014 Primefact 416 3rd edition Dr Graham Bailey, Senior Veterinary Officer, NSW Department of Primary Industries

Photo: Belinda Walker, NSW DPI

Frothy bloat occurs in cattle when grazing forages high in soluble protein and low in fiber, most commonly pastures with a high percentage of immature legumes (alfalfa, white clover) or succulent, vegetative wheat or rye pastures. This disorder is caused by the interaction of many factors including environmental conditions, the structural and chemical composition of the forages present, and physiologic factors within the animal. Because the disorder is multifactorial, frothy bloat occurrence is sporadic, unpredictable and very difficult to completely prevent. It is most reported when cattle, especially yearlings, graze legume or legume-based pastures (over 50% legumes) in the late winter and early spring. Bloat incidence varies year-to-year depending on the relative presence or absence of clover; years with low residual grass cover in the fall, especially after fall drought, and sufficient moisture in the spring will favor clover dominance. Frothy bloat is also a significant cause of death in wheat pastured stocker cattle. The protein content of wheat forage is influenced by plant growth stage and level of nitrogen fertilization. Vegetative wheat has crude protein (CP) values ranging from 18–34% and low neutral detergent fiber levels of 30–40%. Forage samples from bloat-prone wheat pastures contain less dry matter and total fiber while CP and soluble nitrogen fractions are significantly higher. Death losses from pasture bloat are believed to be approximately 2% annually but are sometimes much higher (10-20%) on individual pastures. Costs of bloat include not only losses of livestock but also decreased productivity from avoidance of the most nutritious pastures due to bloat risk.

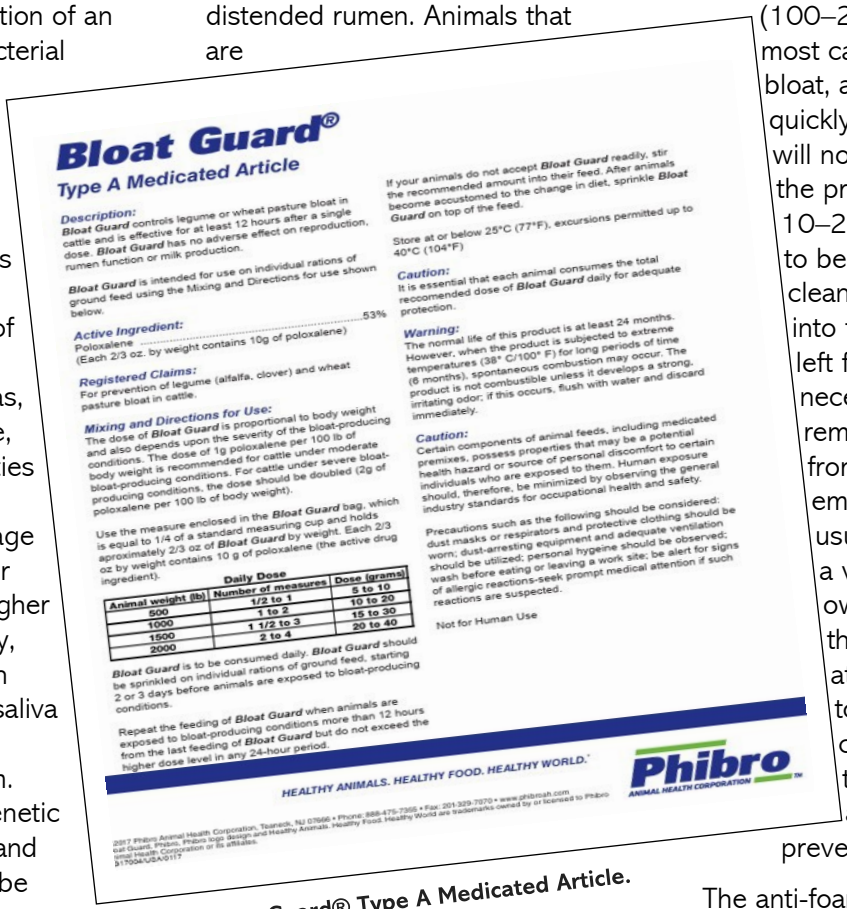
Figure 2: Poloxalene treatment for frothy bloat. *(Accessed via Google Images 3/6/2025)*

Frothy bloat results when fermentation gases become trapped in a stable foam in the rumen that cannot be released by eructation. Requirements for this foam to form are: (1) consumption of a highly digestible, high-protein forage (alfalfa, white clover, wheat) that results in rapid gas production, promotes the growth of ruminal microbial populations, and

Figure 3: Rumen Trocar (above) and Cannula (below).
Accessed via Google Images 3/6/2025

increases rumen fluid viscosity; (2) the presence of fine plant particles (from ruptured chloroplasts) that cause gas bubbles to coalesce in rumen contents; and (3) active ruminal bacterial production of an excessive amount of bacterial "slime" (a mucopolysaccharide complex also known as a "biofilm"). The incidence of bloat is variable between animals and depends on the individual animal's rate of forage fermentation and production of ruminal gas, the digesta passage rate, and the foaming properties of rumen contents. For example, a slower passage rate allows more time for foam formation and a higher chance of bloat. Similarly, the abundance of certain salivary proteins within saliva decreases that animal's formation of rumen foam. Some animals have a genetic predisposition to bloat, and chronic bloaters should be culled.

The signs of bloat are easily recognized if observed; the problem is an animal may go from normal to dead within an hour. Cattle with early bloat display a distended left flank, they stop grazing, they may kick at their belly and be reluctant to move. As bloat advances, the animal may appear distressed (may vocalize, eyes may bulge), stand up and lie down repeatedly, strain to urinate and defecate, exhibit rapid and open mouth breathing, grunting, staggering, and in advanced cases the animal will go down. Death is rapid at this stage due to compression of the lungs, diaphragm, and major organs by the distended rumen. Animals that are mildly affected can be drenched orally or through a stomach tube with a liquid anti-bloat preparation containing the surfactant poloxalene (Therabloat®, Zoetis; Figure 2). After dosing, it is encouraged to keep the animal moving to allow the preparation to mix with the frothy rumen contents. Severely bloated animals in distress need immediate veterinary attention. This may be achieved by inserting a wide bore trocar and cannula (Figure 3) into the rumen at the highest point on the left flank (where the swelling is greatest). After gas and froth is released, an anti-bloat preparation can be poured through the cannula into the rumen to help break down all remaining froth/foam. If poloxalene is unavailable, vegetable oil (250–500 mL) or mineral oil (100–200 mL) can be used. In most cases of advanced frothy bloat, a trocar and cannula will quickly plug up with foam and will not be adequate to relieve the pressure. In those cases, a 10–20 cm incision will have to be made using a scalpel or clean, sharp knife inserted into the highest point of the left flank. It may be necessary to manually remove the frothy material from the rumen. In these emergency cases there is usually no time to wait for a vet to arrive, so livestock owners will have to do this themselves. Veterinary attention is still necessary to irrigate the abdominal cavity, clean and stitch the wound and begin antibiotic treatment to prevent serious infection.



Bloat Guard®

Type A Medicated Article

Description:
Bloat Guard controls legume or wheat pasture bloat in cattle and is effective for at least 12 hours after a single dose. ***Bloat Guard*** has no adverse effect on reproduction, rumen function or milk production.

Bloat Guard is intended for use on individual rations of ground feed using the Mixing and Directions for use shown below.

Active Ingredient:
Poloxalene 53%
(Each 2/3 oz. by weight contains 10g of poloxalene)

Registered Claims:
For prevention of legume (alfalfa, clover) and wheat pasture bloat in cattle.

Mixing and Directions for Use:
The dose of ***Bloat Guard*** is proportional to body weight and also depends upon the severity of the bloat-producing conditions. The dose of 1g poloxalene per 100 lb of body weight is recommended for cattle under moderate bloat-producing conditions. For cattle under severe bloat-producing conditions, the dose should be doubled (2g of poloxalene per 100 lb of body weight).

Use the measure enclosed in the ***Bloat Guard*** bag, which is equal to 1/4 of a standard measuring cup and holds aproximately 2/3 oz of ***Bloat Guard*** by weight. Each 2/3 oz by weight contains 10 g of poloxalene (the active drug ingredient).

Daily Dose		
Animal weight (lb)	Number of measures	Dose (grams)
500	1/2 to 1	5 to 10
1000	1 to 2	10 to 20
1500	1 1/2 to 3	15 to 30
2000	2 to 4	20 to 40

Bloat Guard is to be consumed daily. ***Bloat Guard*** should be sprinkled on individual rations of ground feed, starting 2 or 3 days before animals are exposed to bloat-producing conditions.

Repeat the feeding of ***Bloat Guard*** when animals are exposed to bloat-producing conditions more than 12 hours from the last feeding of ***Bloat Guard*** but do not exceed the higher dose level in any 24-hour period.

If your animals do not accept ***Bloat Guard*** readily, stir the recommended amount into their feed. After animals become accustomed to the change in diet, sprinkle ***Bloat Guard*** on top of the feed.

Store at or below 25°C (77°F), excursions permitted up to 40°C (104°F)

Caution:
It is essential that each animal consumes the total recoommended dose of ***Bloat Guard*** daily for adequate protection.

Warning:
The normal life of this product is at least 24 months. However, when the product is subjected to extreme temperatures (38° C/100° F) for long periods of time (6 months), spontaneous combustion may occur. The product is not combustible unless it develops a strong, irritating odor; if this occurs, flush with water and discard immediately.

Caution:
Certain components of animal feeds, including medicated premixes, possess properties that may be a potential health hazard or source of personal discomfort to certain individuals who are exposed to them. Human exposure should, therefore, be minimized by observing the general industry standards for occupational health and safety.

Precautions such as the following should be considered: dust masks or respirators and protective clothing should be worn; dust-arresting equipment and adequate ventilation should be utilized; personal hygeine should be observed; wash before eating or leaving a work site; be alert for signs of allergic reactions-seek prompt medical attention if such reactions are suspected.

Not for Human Use

HEALTHY ANIMALS. HEALTHY FOOD. HEALTHY WORLD.™

Phibro ANIMAL HEALTH CORPORATION

Figure 4: Bloat Guard® Type A Medicated Article.
(Accessed via Google 3/27/2025)

The anti-foaming agent of choice for prevention of frothy bloat is the feed additive poloxalene (Bloat Guard®, Phibro Animal Health; Figure 4), a

(continued on next page)

Be Aware of Frothly Bloat Risk in Spring Pastures

(continued from page 11)

surfactant that reduces the surface tension of foam, decreases foam formation in the rumen and releases entrapped fermentation gases. It is important to remember that to be effective, adequate amounts of poloxalene must be consumed daily to reduce foam formation. This may require mixing or top-dressing poloxalene at 2 grams per 100 pounds of body weight in feed and offering it daily during the periods of highest risk. Additional poloxalene-containing products are available for use in grazing programs, including mineral supplements, bloat blocks, and liquid feeds. Because of cost, it is generally not economically feasible to feed poloxalene continuously throughout the spring grazing period. Alternatively, feeding the ionophore monensin (Rumensin®) will decrease the amount of stable foam produced during fermentation and reduce bloat risk, along with the added benefits of increasing weight gain and improving feed efficiency. To be most effective, it is recommended to begin feeding monensin products 10-14 days prior to grazing risky pastures.

The current advice to beef producers to prevent frothy bloat is to:

- Avoid grazing cattle on lush, rapidly growing, immature legume or wheat pastures; this is exceptionally important if the forage is wet from dew or rain. Moisture plays a role in a forage's bloat potential. Hungry cattle graze more aggressively when moved to a new pasture, so they should not be moved to new pastures with high legume content until midday—after the dew has dried and after they have grazed or consumed hay in the morning.
- Watch cattle closely for the first few days on new pasture. Bloat onset may be observed within an hour after introduction to new pasture, but cattle more commonly bloat on the second or third day (or longer) following introduction. Observe animals closely following any abrupt change in the weather;
- Slow the movement of cattle to new paddocks when practicing rotational grazing to offer cattle more mature forages in pastures;
- Provide cattle with free-choice access to anti-bloat blocks or offer feed daily that is top-dressed or mixed with poloxalene;
- Ensure cattle always have palatable grass hay available;
- Provide additional calcium to growing cattle grazing wheat pasture. Cereal grains are notoriously low in calcium; ruminal and gut motility is greatly compromised in animals with subclinical deficiencies of blood calcium;
- Always provide a good trace mineral mix to grazing cattle as high potassium and low sodium levels in the rumen are associated with bloat;
- Provide access to a clean water source;
- Grow grass-legume mixtures and/or incorporate bloat-resistant legumes into pastures.

Timely Tips

Dr. Les Anderson, Beef Extension Professor, University of Kentucky

Spring Calving Cow Herd

- Watch cows and calves closely. Work hard to save every calf. Calves can be identified with an ear tag while they are young and easy to handle. Commercial male calves should be castrated and implanted. Registered calves should be weighed at birth.
- Cows that have calved need to be on an adequate nutritional level to rebreed. Increase their feed after calving. Do not let them lose body condition. Keep feeding them until pastures are adequate.
- Do not “rush to grass” although it can be really tempting. Be sure that grass has accumulated enough growth to support the cow’s nutritional needs before depending solely upon it. Cows may walk the pastures looking for green grass instead of eating dry feed. This lush, watery grass is not adequate to support them. Keep them consuming dry feed until sufficient grass is available to sustain body condition. We’ve spent too much money keeping them in good condition to lose it now!
- Prevent grass tetany! Provide magnesium in the mineral mix until daytime temperatures are consistently above 60°F. Mineral supplement should always be available and contain a minimum of about 14% magnesium. Make sure that your mineral mix also contains adequate selenium, copper, and zinc. You can ask your feed dealer about the UK Beef IRM High Magnesium Mineral.
- Make final selection of heifer replacements. Strongly consider vaccinating with a modified-live BVD vaccine.
- Purchase replacement bulls at least 30 days before the breeding season starts. Have herd bulls evaluated for breeding soundness (10-20% of bulls are questionable or unsatisfactory breeders). Get all bulls in proper condition (BCS 6) for breeding.
- If you are going to use artificial insemination and/or estrous synchronization, make plans now and order needed supplies, semen, and schedule a technician.
- Prebreeding or "turnout" working is usually scheduled for late April or May between the end of calving season and before the start of the breeding season (while cows are open). Consult your veterinarian about vaccines and health products your herd needs. Decide now on the products needed and have handling facilities in good working order. Dehorn commercial calves before going to pasture.

Fall Calving Cow Herd

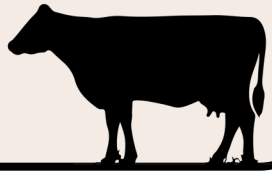
- Determine pregnancy in your herd now and cull open ones at weaning especially if the open cows are older than 6 years of age.
- Re-implant feeders.
- Consult with your veterinarian about preweaning working of the herd.
- You may let calves creep-graze wheat or rye if it is available. Calves will benefit from extra feed until spring grass appears.
- Plan marketing strategy for feeder calves.

Stockers

- Do not go to pastures too soon, give plants some growing time. Then stock at two to three times the July rate and rotate rapidly.
- "Condition" purchased calves prior to grazing. They should be processed and fed a conditioning diet prior to being placed on pasture. You can also use this time to introduce them to electric fences used in rotational grazing.
- Provide a good mineral supplement which contains a rumen modifier (Rumensin, Bovatec, etc.) along with adequate levels of copper and selenium.

General

- We have made a muddy mess this winter, so be prepared to reseed bare spots. Our forage group has some excellent information on restoring heavy-traffic areas.
- Make plans to improve hay feeding areas to avoid muddy conditions like we have faced this winter. Consider geotextile fabric with gravel or concrete feeding pads.
- Prepare for the grazing season. Check fences and make necessary repairs. Check your corral, too.
- Get everything ready to make high quality hay in May! Have equipment serviced and spare parts on hand. Order baler twine now. Be prepared to harvest an adequate supply of hay when you have the opportunity. Re-supply the extra hay that you fed out of the barn. This past winter caused most producers to exhaust their hay supply, so it is time to re-stock.
- Plan now for fly control ... decide what fly control program that you will use but do not put insecticide eartags on cattle until fly population appears.



Grazing too early and too closely can have season long impacts on pastures productivity!!!

Dr. Chris Teutsch, University of Kentucky Research and Education Center at Princeton

After a long winter we are eager to get cattle back on grass. However, starting to graze too early can set pastures back. As grass initiates growth in the spring, it mobilizes energy reserves in the stem base and crown. After this initial energy mobilization, it is important to allow the grass plant to develop adequate leaf area (solar panel) to carry out photosynthesis at a rate that meets its energy needs for growth and maintenance and allows for the replenishment of stored energy that was mobilized. Starting to graze too early reduces the plant's ability to accomplish this task.

Tips for Managing Spring Pasture Growth

Implement rotational grazing. To fully utilize the spring flush of pasture growth YOU must be in control of grazing. In a continuous grazing system, the cows are in charge. By utilizing rotational stocking, you start to make the decisions. Implementing a rotational stocking system may be as simple as closing some gates or stringing up some polywire.

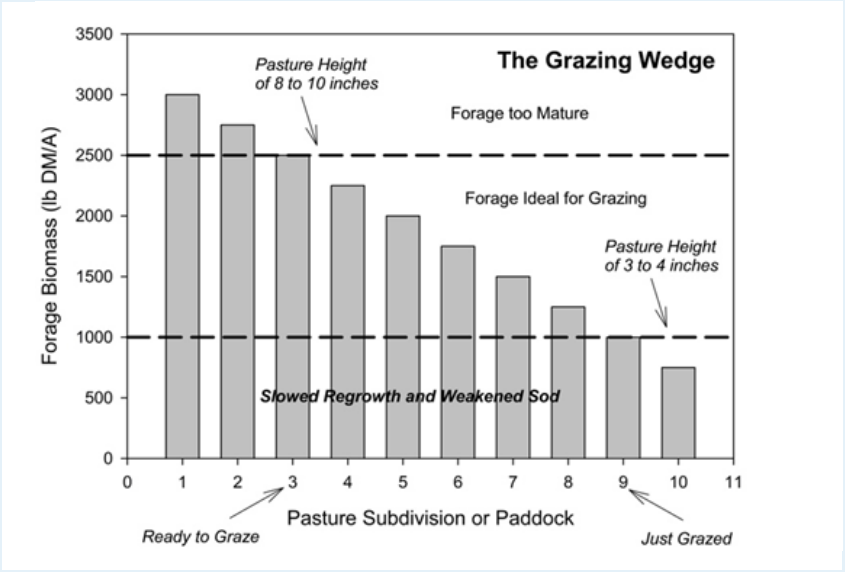
Feed a little hay in late winter and early spring. It is tempting to just let cattle roam and pick pastures for early grass growth, but this can set pastures back and reduce overall dry matter production. It is important to restrict cattle to one area, feed a little hay, and allow pastures to accumulate 4 to 5" of growth before starting to graze.

FORAGE MANAGEMENT TIPS

- Graze winter annuals.
- Flash graze paddocks that were frosted with clover.
- Allow calves and lambs to creep graze.
- As pasture growth begins, rotate through pastures quickly to keep up with initial growth.
- As pasture exceeds the needs of grazing livestock, remove some pastures from the rotation and allow growth to accumulate for hay or silage harvest.
- Get equipment ready to harvest hay at the late boot stage to early head stage top optimize yield and forage quality.
- Determine the need for and prepare to plant warm-season annuals.

Start grazing at 4 to 5" of growth. Another common mistake that graziers make is waiting too long to start grazing. If you wait until the first paddock is ready to graze, 8-10" of growth, by the time you reach the last paddock it will be out of control. Starting a little bit early allows you to establish a "grazing wedge" (Figure 1).

Rotate animals rapidly. It is important to realize that grazing pastures closely and repeatedly as they initiate growth in early spring can reduce production for the entire season. Therefore, it is important to keep animals moving rapidly through the system. The general rule is that if grass is growing rapidly then your rotation should be rapid. This will allow you to stay ahead of the grass by topping it off and keeping it in a vegetative state.



Don't Chase Price per Pound at the Expense of Value per Head

Dr. Kenny Burdine, University of Kentucky

Over the last few months, I have been able to talk with a lot of cattle producers at Extension programs. As you can imagine, the strength of the cattle market is almost always the first topic of discussion. We are seeing prices like we have never seen before for cattle of all types and weights. But my observation has been that producers tend to become a bit more enamored than they should with price per pound and sometimes don't think as much as they should about value per head.

I see this play itself out in a couple ways. First, I hear some producers talk about selling cattle sooner to capture the higher prices. I don't necessarily think that downside price risk is greater in high priced markets, but I think there is a perception among some that there may be "more to lose". This perception lowers interest in adding value to cattle by taking them to higher weight before sale and leads to more calves being sold off the cow, as opposed to being weaned and preconditioned.

Secondly, I think people get too focused on price per pound differences across weight categories and don't make the mental adjustment to the new price environment. To illustrate this point, I am going to use Kentucky average auction prices from the last week of March. The table at right shows the average price for medium / large frame #1-2 steers at 450 lbs, 550 lbs, and 650 lbs. For transparency, I am using the average prices for cattle without a description (not value-added or fancy), which represents most cattle being sold. Also, I am averaging the 50 lb weight ranges to arrive at my average price. In other words, the estimated price per lb for a 450 lb steer is the average of the 400 to 450 lb and 450 to 500 lb weight ranges.

Examine the average prices from Kentucky last week in the table for 450 and 550 lb steers. The price per pound drops by $0.50 on that 100 lb increase in weight. If one looks solely at price per lb, they may be tempted to sell calves sooner and avoid the $0.50 slide. However, in this cattle price environment, those 550 lb steers were still worth $113 per head more than the 450 lb steers. The relevant question becomes whether that difference justifies keeping those 450 lb steers longer. In many cases, the answer to that question may be yes, especially in the spring with pasture starting to grow.

To be fair, cattle prices are extremely high by historical standards. Price slides widen as the overall market gets higher and we have never seen a calf market this high. What may have seemed like a bizarre price slide a few years ago, may make perfect sense now. For example, if 450 lb steers were selling for $2 per lb and we applied the same $0.50 price slide for 550 lb steer, that 550 lb steer at $1.50 per lb is actually worth $75 less than the 450 lb steer at $2. But that is irrelevant in the current market.

The main point is that the spring 2025 feeder cattle price environment is like nothing we have seen before. Given that, we must be careful about using rules of thumb and simple approaches that may have worked in the past. Focusing on price per lb, without consideration of weight impacts, can be very misleading. And one needs to be careful they aren't chasing price per lb at the expense of value per head!

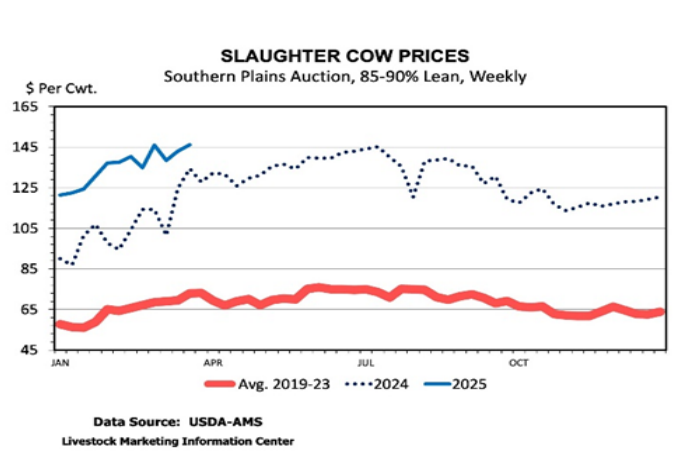
Feeder Cattle Values by Weight and Price per Pound

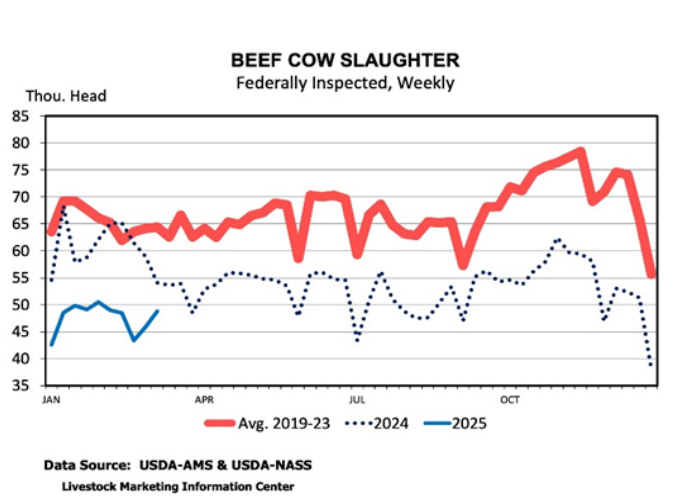
KY Auction Prices (March 31, 2025)

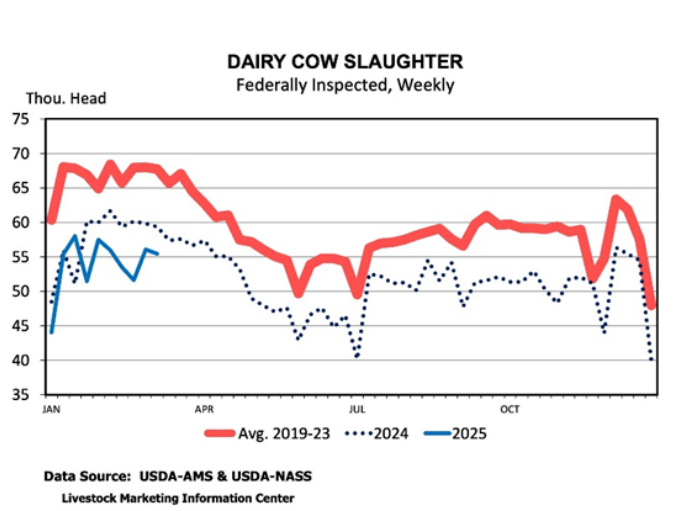
Average Weight	ML#1-2 Steer Price	Value Per Head	Value of Last 100 lbs
450 lbs	$3.88 per lb	$1,746	-------
550 lbs	$3.38 per lb	$1,859	$113
650 lbs	$3.16 per lb	$2,054	$195

Record Cow Prices! It's Not April Fools!

Spring is here and not only are calf and fed cattle prices record high, but cull cow prices have joined the action. Cow prices typically increase from late in the previous year until about May-June. Both supply and demand factors contribute to higher cull cow prices in the Spring. On the supply side, total cow slaughter tends to decline until the middle of the year. On the demand side grilling season is starting and that means more demand for ground beef.







Cull cow prices in the Southern Plains have increased from $121 to $145 per cwt since the first of the year. Auction prices a year ago in those markets averaged $134 per cwt. On the meat side, the cow-beef cutout climbed to $297 per cwt. At the same time, wholesale 90 percent lean boneless beef hit $382 per cwt. Pretty clearly tight supplies and Spring grilling season demands are sending prices higher.

On the supply side, cow slaughter, typically, slowly declines until mid-year. That is about where we are through March, maybe a small downward trend in weekly average slaughter. While the pattern of slaughter is pretty normal, the numbers going to slaughter are sharply lower. Through mid-March, beef and dairy cow slaughter are down 20 percent and 6.6 percent, respectively. The decline amounts to 16,000 fewer total cows going to packers per week than last year.

It's worth noting that beef cow and dairy cow slaughter exhibit different seasonality throughout the year. Beef cow slaughter tends to decline in Spring, have a mid-year increase, then a peak late in the year. Dairy cow culling peaks early then declines to seasonal lows in mid-year. Production systems across the country largely explain these seasonal peaks and valleys.

While cow slaughter is lower than last year reducing lean beef supplies, imports are adding lean beef trimming supplies. Beef imports in January totaled a monthly record of 608 million pounds. Imports from Brazil were almost a third of total beef imports for the month at 198 million pounds. Brazilian beef imports normally decline after January so total beef imports should decline over the next few months.

There is more room for cow prices to increase further over the next couple of months. Grilling season is just getting started for a lot of the country. Fewer cows going to market will keep prices above a year ago the rest of the year. Higher fed cattle prices should help support cull cow prices.

USDA Expediting $10 Billion in Direct Economic Assistance to Agricultural Producers

Marking National Agriculture Day, Secretary Rollins Prioritizes Timely Support for Farmers

USDA Farm Service Agency
U.S. DEPARTMENT OF AGRICULTURE

WASHINGTON, March 18, 2025 – U.S. Secretary of Agriculture Brooke Rollins, on National Agriculture Day, announced that the U.S. Department of Agriculture (USDA) is issuing up to $10 billion directly to agricultural producers through the Emergency Commodity Assistance Program (ECAP) for the 2024 crop year. Administered by USDA's Farm Service Agency (FSA), ECAP will help agricultural producers mitigate the impacts of increased input costs and falling commodity prices.

"Producers are facing higher costs and market uncertainty, and the Trump Administration is ensuring they get the support they need without delay," said Secretary Rollins. "With clear direction from Congress, USDA has prioritized streamlining the process and accelerating these payments ahead of schedule, ensuring farmers have the resources necessary to manage rising expenses and secure financing for next season."

Authorized by the American Relief Act, 2025, these economic relief payments are based on planted and prevented planted crop acres for eligible commodities for the 2024 crop year. To streamline and simplify the delivery of ECAP, FSA will begin sending pre-filled applications to producers who submitted acreage reports to FSA for 2024 eligible ECAP commodities soon after the signup period opens on March 19, 2025. Producers do not have to wait for their pre-filled ECAP application to apply. They can visit fsa.usda.gov/ecap to apply using a login.gov account or contact their local FSA office to request an application once the signup period opens.

Eligible Commodities and Payment Rates

The commodities below are eligible for these per-acre payment rates:

- Wheat - $30.69
- Eligible oilseeds:
- Corn - $42.91
- Canola - $31.83
- Sorghum - $42.52
- Crambe - $19.08
- Barley - $21.67
- Flax - $20.97
- Oats - $77.66
- Mustard - $11.36
- Upland cotton & Extra-long staple cotton - $84.74
- Rapeseed - $23.63
- Long & medium grain rice - $76.94
- Safflower - $26.32
- Peanuts - $75.51
- Sesame - $16.83
- Soybeans - $29.76
- Sunflower - $27.23
- Dry peas - $16.02
- Lentils - $19.30
- Small Chickpeas - $31.45
- Large Chickpeas - $24.02

Producer Eligibility

Eligible producers must report 2024 crop year planted and prevented planted acres to FSA on an FSA-578, Report of Acreage form. Producers who have not previously reported 2024 crop year acreage or filed a notice of loss for prevented planted crops must submit an acreage report by the Aug. 15, 2025, deadline. Eligible producers can visit fsa.usda.gov/ecap for eligibility and payment details.

Applying for ECAP

Producers must submit ECAP applications to their local FSA county office by Aug. 15, 2025. Only one application is required for all ECAP eligible commodities nationwide. ECAP applications can be submitted to FSA in-person, electronically using Box and One-Span, by fax or by applying online at fsa.usda.gov/ecap utilizing a secure login.gov account.

If not already on file for the 2024 crop year, producers must have the following forms on file with FSA:

Form AD-2047, Customer Data Worksheet.

Form CCC-901, Member Information for Legal Entities (if applicable).

Form CCC-902, Farm Operating Plan for an individual or legal entity.

Form CCC 943, 75 percent of Average Gross Income from Farming, Ranching, or Forestry Certification (if applicable).

AD-1026, Highly Erodible Land Conservation (HELC) and Wetland Conservation (WC) Certification.

SF-3881, Direct Deposit.

Except for the new CCC-943, most producers, especially those who have previously participated in FSA programs, likely have these forms on file. However, those who are uncertain and want to confirm the status of their forms or need to submit the new Form-943, can contact their local FSA county office.

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When You're Hot, You're Hot!

Dr. Les Anderson, Beef Extension Professor, University of Kentucky

Last summer was a challenge for livestock. Kentucky recorded over 35 days with temperatures that exceeded 90^{0}F and our temperature-humidity index was in the dangerous category for livestock for most of June and July. The impact of heat stress on livestock has been extensively studied over the last several decades. Heat stress reduces growth rate, can shorten gestation, increase lameness, disease, and death rates. Perhaps the most dramatic impact of heat stress is the marked reduction in reproductive efficiency.

Now is the perfect time to start planning to overcome heat stress. When I first got to UK, our Angus cows were involved in a variety of trials examining the impact of consuming endophyte-infected fescue on reproductive rate. For several years, these cows were synchronized for AI around June 10 and then exposed to a bull for 70 days. Cows consuming only endophyte-infected fescue had 55-62% pregnancy rates at the end of the breeding season. Similarly, Dr. Burris at Princeton demonstrated that the conception rate of cows decreased from 70% in early spring (April 1 – June 1) to 35% in the summer (June 20 – August 1) resulting in a pregnancy rate decrease from 90% to 58%. Heat stress reduces pregnancy rate by increasing the abortion rate of young, developing embryos and fetuses. Extreme heat stress results in embryonic/fetal loss for at least the first 45 days of pregnancy. If you are a spring calver and your cattle are consuming endophyte-infected fescue, your cows may have struggled to get pregnant this spring/summer. Plan now to determine pregnancy and hope for the best. Fall-calving cows are not immune to issues with heat stress. Heat stress and consumption of endophyte-infected fescue can induce early parturition (30-40 days premature labor), increase the thickness of the placenta, and increases calf death loss.

How can we manage heat stress?

How can we manage heat stress? Are there management protocols that can help? Understanding solutions begins with understanding the problem. Cattle have difficulty dissipating heat effectively because they don't sweat as well as other animals. Since they don't sweat well, cattle dissipate heat by increasing their respiration rate, decreasing their activity, dilating their blood vessels near their skin so they can more effectively radiate the heat from their body, and eating less. Eating and digestion generates heat so they intake less feed to reduce the internal blood temperature. In Kentucky, and the rest of the "fescue belt," heat stress is heightened by consuming endophyte-infected fescue. Endophyte is a fungus that grows in fescue plants and this fungus produces chemicals, generically called alkaloids, that have a variety of negative impacts on animals. One of the main impacts of consumption of endophyte-infected fescue is the alkaloids constrict the blood vessels of the animal which reduces the ability of the animal to dissipate heat via radiation. So, if we want to alleviate issues with heat stress, we need to find management protocols to help cattle dissipate heat.

Fortunately, we have options! Logically, the first place to start is simply do not graze endophyte-infected fescue during the summer but this is often not a viable option for many cattle producers. The breeding season can be shifted to earlier in the spring (April – June vs May – August) but this will lead to cows calving earlier in the winter, which may not be an acceptable option either. Cows supplemented with high fat supplements (ex. whole soybeans, liquid fats supplements, distiller's products) during heat stress can increase pregnancy rates in beef cows. Providing a complete mineral mix containing a blend of sodium

selenite and selenium yeast, like the UK Beef IRM mineral has been shown to increase hormone concentrations necessary to support early gestation. Also, the USDA-ARS research group in Lexington has demonstrated that consumption of red clover can aid cattle during heat stress. Red clover leaves contain chemicals called isoflavones that dilate peripheral blood vessels, reduce heat stress, and can increase pregnancy rates. Most legumes have these isoflavones but the chemicals vary in the bioavailability and concentrations of the isoflavones. Whole soybeans and soyhulls also contain isoflavones and can be used to help reduce the impact of fescue toxicosis.

We cannot control the temperature, but we can plan to help our cattle withstand heat stress. Develop a heat mitigation plan by limiting cattle access to endophyte-infected fescue and/or providing access of cattle to supplements or pastures that contain fat or isoflavones. Contact your veterinarian and set dates to determine pregnancy in our herd. If you have several open cows, adding a short fall-calving season is an option. We can also use this experience to help develop a plan for heat stress in the future. This cattle market is hot, and producers need to maximize their pregnancy rates and heat stress is the main factor that reduces pregnancy especially in the summer. A little planning, a little tweak to your management plan will pay huge dividends.

USDA Expediting $10 Billion in Direct Economic Assistance to Agricultural Producers

(continued from page 17)

If a producer does not receive a pre-filled ECAP application, and they planted or were prevented from planting ECAP eligible commodities in 2024, they should contact their local FSA office.

ECAP Payments and Calculator

ECAP payments will be issued as applications are approved. Initial ECAP payments will be factored by 85% to ensure that total program payments do not exceed available funding. If additional funds remain, FSA may issue a second payment.

ECAP assistance will be calculated using a flat payment rate for the eligible commodity multiplied by the eligible reported acres. Payments are based on acreage and not production. For acres reported as prevented plant, ECAP assistance will be calculated at 50%.

For ECAP payment estimates, producers are encouraged to visit fsa.usda.gov/ecap to use the ECAP online calculator.

More Information

To learn more about FSA programs, producers can contact their local USDA Service Center. Producers can also prepare maps for acreage reporting as well as manage farm loans and view other farm records data and customer information by logging into their farmers.gov account. If you don't have an account, sign up today.

FSA helps America's farmers, ranchers and forest landowners invest in, improve, protect and expand their agricultural operations through the delivery of agricultural programs for all Americans. FSA implements agricultural policy, administers credit and loan programs, and manages conservation, commodity, disaster recovery and marketing programs through a national network of state and county offices and locally elected county committees. For more information, visit fsa.usda.gov.

Petroleum Product Poisoning of Cattle

Petroleum fractions have been used alone or as part of external parasite control product mixtures to combat flies and ticks in cattle for many years. In appropriate applications, they may be applied to the skin with few or no harmful effects on the animals. However, exposing cattle to large quantities of petroleum hydrocarbons or over prolonged periods of time can lead to petroleum product poisoning. This condition results from cattle exposure to petroleum, petroleum condensate, gasoline, diesel fuel, kerosene, crude oil, or other petroleum-based hydrocarbons. It can cause production losses, animal health problems, and possible death.

Sources of Petroleum Hydrocarbon Exposure

It is important for cattle producers to be aware of possible sources of petroleum hydrocarbon exposure and take appropriate steps to reduce or eliminate exposure risk. Animals may ingest petroleum hydrocarbons out of curiosity, in an attempt to add salt to their diets, when water is not available, or when feedstuffs or water supplies are contaminated. They can also be exposed to petroleum hydrocarbons through skin contact. In addition, cattle risk exposure when they are confined in areas with poor ventilation where these products are used or stored.

Fuels or other hydrocarbon materials left in open or leaky containers accessible by cattle put animals at risk for petroleum product poisoning. Toxic additives or contaminants such as lead make older formulations of lubricating oils and greases particularly hazardous to cattle. Leaded gasoline, used engine oil filters, used motor oil, grease (which may contain 50 percent lead), and oil field wastes are just some of the petroleum-related items that may contain lead. Cattle will readily drink or lick these oils and greases and can die after only small amounts are consumed. Lead poisoning results in anemia, blood vessel damage, bleeding, kidney damage, liver damage, and tissue oxygen deprivation, ultimately causing sterility, abortion, and death.

Crude oil is commonly produced and transported on and across land used for grazing by cattle. Cattle exposure to petroleum-derived hydrocarbons may occur at or near petroleum exploration and production sites. Crude oil or petroleum hydrocarbon components of crude oil can exist as liquid or vapor, attached to soil, or dissolved in water. Benzene, toluene, ethylbenzene, and xylene (BTEX) are petroleum components that are particularly soluble, mobile, and toxic, and these components are present in varying amounts in crude oil. Crude oil from accidental leaks and spills such as pipeline breaks, accidental storage tank releases, and car accidents can contaminate soil, forage, feed, and/or water. Cattle may then consume these contaminated items or become exposed through other means.

Incidental contaminated soil ingestion, contaminated water ingestion, and direct petroleum ingestion are the most likely avenues for crude oil exposure by cattle. Cattle may consume contaminated soil inadvertently during grazing or purposely ingest salty-tasting soil. The amount of contaminated water ingested by cattle varies by animal age, physiological status (pregnancy, lactation, growth, fattening), breed, size, diet composition, and environmental temperature.

Viscosity describes the “thickness” of a fluid. Low- viscosity fluids such as water flow freely, whereas highly viscous fluids such as honey resist flow more so. The viscosity of petroleum and petroleum-derived hydrocarbon mixtures influences animal exposure risk.

Lowly viscous products such as gasoline, naphtha, and kerosene are more likely to be inhaled into the lungs and may induce vomiting, which increases aspiration hazard. These low-viscosity products also tend to irritate the trachea and lung tissues. In comparison, more viscous petroleum-based hydrocarbons are less likely to be breathed in and tend to be less damaging to lung tissue.

Evaluating Exposure Risk

It is possible to evaluate the potential risk to cattle exposed to petroleum hydrocarbons at a site. A toxicity reference value (TRV) is the daily amount of chemical exposure at or below which no adverse health or production effects are expected, even if exposure occurs over an extended duration. A TRV is determined from available toxicological data and expressed in milligrams of chemical per kilogram of cattle body weight. Toxicity reference values are designed to help protect the herd from chemical toxicity **(Table 1).**

Risk-based screening levels (RBSL) are threshold concentrations of contaminants in soil and water, at or below which little to no likelihood of significant unacceptable risks to cattle are expected. Concentrations of petroleum hydrocarbons in soil in milligrams per kilogram (mg/kg) and

water in milligrams per liter (mg/L) at a site can be compared to RBSL protective of cattle **(Tables 2 and 3).**

Signs of Petroleum Poisoning in Cattle

Monitor cattle closely for signs of petroleum poisoning, including pneumonia, smell of petroleum on breath, diarrhea, smell of petroleum in manure, and oil around mouth, nostrils, and legs. Petroleum product poisoning damages hide, nervous, respiratory, gastrointestinal, kidney, and liver tissue depending on the route of exposure. Skin lesions may develop after repeated or severe exposure. The hide may become dry, cracked, or blistered.

Acute (severe) bloat can occur shortly after consumption of petroleum hydrocarbons and result in death, but this does not happen in all cases. It is more common after consumption of highly volatile petroleum products. Affected cattle may appear thin or lethargic within 24 hours of exposure and lasting up to 2 weeks depending on the dose and content. Rumen motility (movement) slows within the first day after ingestion.

Normal digestive function may not return in some cattle, leading to a chronic wasting condition. Low blood glucose (sugar) levels are also sometimes found several days after ingestion. Manure may not be affected until several days after ingestion and can include oil up to 2 weeks after petroleum product consumption. Manure pats may appear excessively dry. Some reports show increased diarrhea incidence after crude oil consumption.

Ingestion of large volumes of crude oil results in vomiting and aspiration into the lungs. Nervous system damage is usually associated with inhalation of petroleum- based products. Excitability, depression, shivering, head tremors, vision disruption, and incoordination can arise following lung absorption of petroleum hydrocarbons. The most serious consequence of breathing in these hydrocarbons is pneumonia. Severe pneumonia; coughing; rapid, shallow breathing; reluctance to

(continued on next page)

Table 1. Beef cattle toxicity reference values (TRV) for petroleum and petroleum-derived products.

TRV for Animal Class, mg/kg body weight/day		
Petroleum product	**Beef cow [1]**	**Calf [2]**
Crude oil	211	211
Benzene	5.95	10.3
Toluene	37.1	64.5
Ethylbenzene	4.86	8.43
Xylene	29.8	51.7
LMW PAH3	0.833	1.45
HMW PAH4	0.167	0.289

[1] Beef cow weighing 1,000 pounds.
[2] Calf weighing 110 pounds.
[3] Low molecular weight polycyclic aromatic hydrocarbons.
[4] High molecular weight polycyclic aromatic hydrocarbons.
Source: Adapted from Pattanayek and DeShields, 2003.

Table 2. Beef cattle risk-based screening levels (RBSL) for petroleum and petroleum-derived products in soil.

Soil RBSL for Animal Class, mg/kg		
Petroleum product	**Beef cow [1]**	**Calf [2]**
Crude oil	44,894	44,894
Benzene	1,266	2,198
Toluene	7,901	13,715
Ethylbenzene	1,033	1,794
Xylene	6,331	10,990
LMW PAH3	177	308
HMW PAH4	35.5	61.5

[1] Beef cow weighing 1,000 pounds, eating 25.1 pounds of feedstuffs per day.
[2] Calf weighing 110 pounds, eating 2.8 pounds of feedstuffs per day.
[3] Low molecular weight polycyclic aromatic hydrocarbons.
[4] High molecular weight polycyclic aromatic hydrocarbons.
Source: Adapted from Pattanayek and DeShields, 2003.

Table 3. Beef cattle risk-based screening levels (RBSL) for petroleum and petroleum-derived products in drinking water.

Drinking Water RBSL for Animal Class, mg/L		
Petroleum product	**Beef cow [1]**	**Calf [2]**
Crude oil	1,114	293
Benzene	31.4	14.3
Toluene	196	89.5
Ethylbenzene	25.6	11.7
Xylene	157	71.7
LMW PAH3	4.40	2.01
HMW PAH4	0.880	0.402

[1] Beef cow weighing 1,000 pounds, drinking 22.7 gallons of water per day.
[2] Calf weighing 110 pounds, drinking 9.5 gallons of water per day.
[3] Low molecular weight polycyclic aromatic hydrocarbons.
[4] High molecular weight polycyclic aromatic hydrocarbons.
Source: Adapted from Pattanayek and DeShields, 2003.

Petroleum Product Poisoning of Cattle

(continued from page 21)

move; head held low; weakness; dehydrated appearance; and oily nasal discharge can be seen in animals that breathe in highly volatile mixtures. Death often follows within days. Pneumonia causes decreased white blood cell counts followed by increased white blood cell numbers, as well as changes to other blood components.

Reproductive losses, production losses, and animal death are possible outcomes of petroleum hydrocarbon exposure. Reproductive and developmental effects have generally been reported at higher doses than those reported for other health effects. Secondary infections are another concern with petroleum product poisoning.

Response Actions Needed

If petroleum product poisoning is suspected, immediately consult with a veterinarian. A veterinarian can diagnose the condition and initiate a proper treatment program. Provide detailed information on petroleum product exposure, animal production conditions, and signs of illness to help address the problem more quickly and effectively.

Conduct immediate and ongoing assessments of the distribution of oil or other petroleum products with potential to affect livestock, forage, and watering resources. Remove cattle from the contaminated area to prevent additional exposure to petroleum hydrocarbons. Provide them with uncontaminated fresh water and feedstuffs adequate for their nutritional requirements.

Identify and obey applicable environmental laws and standards to establish cleanup criteria for contaminated areas. Do not allow any cattle to return to these areas until appropriate cleanup steps have been taken to endpoints that are protective of livestock. Follow up with long-term monitoring of soil, water, and forage for petroleum hydrocarbon contamination in previously contaminated areas.

For more information on petroleum product poisoning or beef cattle production, contact your local MSU Extension office.

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Merck and Co., Inc. 2008. Petroleum Product Poisoning. The Merck Veterinary Manual. Whitehouse Station, NJ.

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Cooperative Extension Service

CAMPBELL COUNTY FARMERS MARKET 2025

Highland Heights*— Tuesdays
Senior Citizens Activity Center
3504 Alexandria Pike
May 13 thru October 28
3:00 p.m. to 6:00 p.m.

Fort Thomas**— Wednesdays
Mess Hall in Tower Park
801 Cochran Avenue
April 9 thru December 17
3:00 p.m. to 6:00 p.m.
Hours extend to 7:00 p.m. June-September
(Senior shopping begins at 2:45 p.m.)

Alexandria*— Fridays
Southern Lanes Sports Center
7634 Alexandria Pike
May 16 thru October 24
3:00 p.m. to 6:00 p.m.

Newport*— Saturdays
Next to Pepper Pod Restaurant
709 Monmouth Street
May 18 thru October 26
9:00 a.m. to 12 noon

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* Accepts WIC, SNAP and Senior Farmer's Market Nutrition Program

** Accepts WIC, SNAP, Senior Farmer's Market Nutrition Program and Kentucky Double Dollars

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Cooperative Extension Service

Agriculture and Natural Resources
Family and Consumer Sciences
4-H Youth Development
Community and Economic Development

MARTIN-GATTON COLLEGE OF AGRICULTURE, FOOD AND ENVIRONMENT

Lexington, KY 40506

Disabilities accommodated with prior notification.

Campbell County Cooperative Extension
3500 Alexandria Pike
Highland Heights, KY 41076
(513) 572-2600

University of Kentucky Meat Cutting School
Beef Processing Workshop

The University of Kentucky Meat Cutting School will be offering a Beef Processing Workshop. The workshop will be a hands-on experience with some formal lectures on the meats and livestock industries. Although experience is the best teacher, this workshop is designed to introduce basic slaughter techniques along with basic beef fabrication and ground beef skills. The workshop is hands-on is open to the first six paid participants that are serious about learning more about beef processing.

When: May 23-25, 2025

Where: University of Kentucky Meats Lab (325 Cooper Dr)

Meeting Times:

Monday, June 16th (2-4:30pm EDT)
- Tour of the meats lab and pick up equipment.

Tuesday, June 17th (8am to 4pm EDT)
- Hands-on Beef Slaughter
- Classroom lectures

Wednesday, June 18th (8am EDT)
- Hands-on Beef Carcass Fabrication
- Ground Beef
- Discussion and workshop evaluation

Cost: $500/person. Checks can be made out to the *University of Kentucky Meat Science*.

Participants will receive: hat, frock, kill floor apron, 6" boning knife, certificate of completion

Registration can be mailed to Dr. Gregg Rentfrow (address below).

Who: This workshop is open to the first 6 participants (paid).

Questions/Contact:

Dr. Gregg Rentfrow, Ph.D.
205 W.P. Garrigus Building
Lexington, KY, 40546
gregg.rentfrow@uky.edu
859-257-7550

Martin-Gatton
College of Agriculture, Food and Environment
University of Kentucky

Recipes from the 2025 Food and Nutrition

Recipe Calendar

Cooperative Extension Service

Lemon Broccoli Pasta

USDA Supplemental Nutrition Assistance Program

Putting Healthy Food Within Reach

This institution is an equal opportunity provider. This material was partially funded by USDA's Supplemental Nutrition Assistance Program — SNAP.

Prep time: 15 minutes
Cook time: 25 minutes

- 1 box (16 ounces) whole-wheat pasta (rotini, spaghetti, bowtie, elbow macaroni)
- 1 package (12 to 14 ounces) frozen broccoli
- Zest of one lemon
- Juice of one lemon (about 2 tablespoons of lemon juice)
- 2 tablespoons olive oil
- 2 1/2 teaspoons garlic powder or 1 clove of garlic, minced
- 2 cups spinach
- 1 cup grated parmesan cheese
- 1 cup reserved pasta water
- Salt and pepper, to taste

1. Wash hands with warm water and soap, scrubbing for at least 20 seconds.
2. Boil water and prepare pasta according to package directions. Be sure to save 1 cup of pasta water for later use.
3. While the pasta cooks, microwave broccoli for about 5 minutes, or until thawed.
4. In a large saucepan over medium heat, add oil and sauté broccoli for 3-5 minutes.
5. Add cooked pasta to the saucepan with the broccoli. Add lemon zest, lemon juice, garlic, spinach, and reserved pasta water. Use tongs or a spoon to evenly combine everything. Cook until spinach is wilted, about 5 minutes.
6. Sprinkle over parmesan cheese and stir to combine. Reduce heat to low and cook for an additional 3 to 5 minutes or until it reaches desired texture.
7. Serve.
8. Refrigerate leftovers within 2 hours.

Makes 8 servings
Serving size: 1 1/2 cups
Cost per recipe: $8.56
Cost per serving: $1.07

Nutrition facts per serving:
320 calories; 9g total fat; 2.5g saturated fat; 0g trans fat; 10mg cholesterol; 200mg sodium; 51g total carbohydrate; 7g dietary fiber; 2g total sugars; 0g added sugars; 13g protein; 0% Daily Value of vitamin D; 10% Daily Value of calcium; 15% Daily Value of iron; 4% Daily Value of potassium

Source:
Jeannie Noble, RD, Extension Specialist for Nutrition; and Jen Robinson, NEP Area Nutrition Agent, University of Kentucky Cooperative Extension Service

Cooperative Extension Service

Agriculture and Natural Resources
Family and Consumer Sciences
4-H Youth Development
Community and Economic Development

MARTIN-GATTON COLLEGE OF AGRICULTURE, FOOD AND ENVIRONMENT

Lexington, KY 40506

Enjoy the freshness, flavor and excellence of Kentucky Proud Produce

It really makes a difference when you purchase locally grown fruits and vegetables. You provide your family with garden fresh taste and quality, while also helping the community by keeping your food dollars close to home.

Colorful Eating

Color-code your shopping and be on your way to better health. Each color group of produce offers different phytochemicals, antioxidants and nutrients that help you stay healthy in a variety of ways.

Get the blues (and purples)

Brain/memory, healthy aging, urinary tract

Fruits
- Blackberries
- Blueberries
- Grapes
- Plums

Vegetables
- Eggplant
- Kohlrabi
- Purple asparagus
- Purple cabbage
- Purple carrots
- Purple peppers

Great greens

Vision, bones, teeth

Fruits
- Apples
- Grapes
- Paw paws
- Pears

Vegetables
- Asparagus
- Beans
- Broccoli
- Brussel sprouts
- Cabbage
- Cucumbers
- Kohlrabi
- Leafy greens
- Lettuce
- Okra
- Onions (green)
- Peas
- Peppers
- Zucchini

Wonderful whites

Heart, maintain healthy cholesterol

Fruits
- Pears (brown)
- White peaches

Vegetables
- Cauliflower
- Kohlrabi
- Onions
- Potatoes
- White corn

Outstanding oranges (and yellows)

Vision, immune system, heart

Fruits
- Cantaloupe
- Peaches
- Yellow apples
- Yellow pears
- Yellow watermelon

Vegetables
- Carrots
- Corn
- Golden potatoes
- Peppers
- Pumpkins
- Squash
- Sweet potatoes
- Yellow tomatoes

Radiant reds

Heart, urinary tract, brain/memory

Fruits
- Apples
- Grapes
- Pears
- Raspberries
- Strawberries
- Watermelons

Vegetables
- Beets
- Radishes
- Red peppers
- Sorghum
- Tomatoes
- Turnips

Kentucky Proud

Laparoscopic AI Day

for Small Ruminants

Cooperative Extension Service

July 25 & 26

Campbell County Extension

Agriculture Complex

13169 Alexandria Pike

Butler, KY 41006

Michelle Simon
Extension Agent, Agriculture and Natural Resources

Embryo Services can also be provided. Inquire with Dr. Schroeder before June 13th to arrange.

Registration Required
Call to schedule your appointment.

Gary Downs
(859) 462-6042

Dr. Luke Trapp
(859) 743-1577

Dr. Schroeder
(262) 749-1440

Cooperative Extension Service

Agriculture and Natural Resources
Family and Consumer Sciences
4-H Youth Development
Community and Economic Development

MARTIN-GATTON COLLEGE OF AGRICULTURE, FOOD AND ENVIRONMENT

Lexington, KY 40506

Disabilities accommodated with prior notification.

How do you select your bulls?

Darrh Bullock, University of Kentucky and Matt Spangler, University of Nebraska

Bull selection is one of the most important decisions that a beef producer makes and can have a lasting impact on profitability. Factors such as the market endpoint of calves (e.g., newly weaned or finished cattle), whether replacements will be retained, and the level of nutritional management provided to the cow herd all impact which traits should be selected for and at what level. Understanding this complex relationship can be the difference between buying a "good" bull and buying the right bull.

The eBEEF.org team, a group of beef cattle geneticists from across the US, is trying to determine how beef producers are currently selecting their bulls and will use this information to develop educational materials to help improve this process. Knowing which traits to select for is often not the problem, it is the degree to which each should be emphasized that can be highly variable from producer to producer and can often be challenging to determine. Too often this process is more 'seat of the pants' rather than by factors affecting profitability. For example, trying to find the optimal level of calving ease without sacrificing profit by not emphasizing traits like sale weight of the calves enough.

To assess how beef producers are selecting bulls, within their level of management, we are asking you to fill out a brief survey. This should take approximately 10 minutes of your time and provide a wealth of information for the beef industry! This information will be used to compare the survey results to values generated by iGENDEC, a software package that determines the most profitable level of emphasis that should be placed on each trait within a specific production system.

Several incentives are being offered to encourage participation in this survey. The first is a random drawing for five $100 gift cards generously donated by the Beef Improvement Federation (beefimprovement.org). The second is a special webinar that will be offered to everyone that completes a survey, and provides their email address, to discuss the findings of the survey and resulting bull selection strategies. Lastly, and possibly most importantly, knowledge gained by beef producers by going through this process and the entire beef industry through better bull selection decisions.

Beef Bull Selection Survey

Chance to win one of five $100 gift cards sponsored by the Beef Improvement Federation

eBEEF.ORG

https://corexmsd9bfwdhxgbhmw.qualtrics.com/jfe/form/SV_eFqYgoQpZMJLRLE