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Beef IRM Team

OFF THE HOOF

KENTUCKY BEEF CATTLE NEWSLETTER SEPTEMBER 6, 2023

Published Monthly by UK Beef IRM Team and edited by Dr. Les Anderson, Beef Extension Specialist, Department of Animal & Food Science, University of Kentucky

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This month's newsletter includes:

Timely Tips

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

Spring-Calving Cows

- Bulls should have been removed from the cow herd by now! They should be pastured away from the cow herd with a good fence and allowed to regain lost weight and condition. It is a good time to evaluate physical condition, especially feet and legs. Bulls can be given medical attention and still have plenty of time to recover, e.g., corns, abscesses, split hooves, etc. Don't keep trying to get open spring cows bred – move them to fall calving or sell them when they wean this year's calf. If you don't have a bull pen and want to tighten up the calving season, remove the bull and sell him. Plan on purchasing a new bull next spring.
- Repair and improve corrals for fall working and weaning. Consider having an area to wean calves and retain ownership for postweaning feeding rather than selling "green", lightweight calves. Plan to participate in CPH-45 feeder calf sales in your area.
- Limited creep feeding can prepare calves for the weaning process since they can become accustomed to eating dry feed. This will especially benefit those calves which you are going to keep for a short postweaning period – like the CPH-45 program. It's time to start planning the marketing of this year's calf crop.

- Begin evaluating heifer calves for herd replacements – or culling. Each time you put them through the chute you can evaluate them for several traits, especially disposition. Consider keeping the older, heavier heifers. They will reach puberty before the onset of the breeding season and have higher conception rates.
- This has generally been a good year for pastures, but many parts of the state are starting to get a bit dry. Evaluate moisture condition and consider stockpiling some fescue pastures. It's not too late to apply nitrogen for stockpiling fescue if moisture conditions have improved.
- Stresses associated with weaning can be minimized by spreading-out other activities commonly associated with weaning – like vaccinations, deworming, castration and dehorning (which should have already been done!). Therefore, this month is a good time to do a "preweaning" working of cows and calves.
- When planning the preweaning working, consult with your veterinarian for advice on animal health products and procedures. One procedure that can be done now is pregnancy checking cows. Early pregnancy diagnosis will allow time to make culling decisions prior to weaning time. Feeding non-productive cows through the winter is a costly venture so pregnancy diagnosis is a sound business decision a producer can make.

Fall-Calving Cows

- Fall-calving should start this month. Get your eartags ready. Cows should be moved to a clean, accessible pasture and be watched closely. Tag calves soon after they are born and record dam ID and calf birthdate, etc. Castration is less stressful when performed on young animals and calves which are intended for feeders can be implanted now, too.
- If you haven't started calving quite yet, then it's time to get ready. Be sure you have the following:
    - record book
    - eartags for identification
    - odine solution for newborn calf's navel
    - calf puller○ castration equipment
- Watch for those calves which may come early and be prepared to care for them.
- Be on the guard for predators – especially black vultures.
- Move cows to high quality fall pasture after calving. Stockpiled fescue should be available to these cows in November-December to meet their nutritional needs for milking and rebreeding.
- Start planning now for the breeding season. If using AI, order supplies, plan matings and order semen now.

Stockers

- Calves to be backgrounded through the winter can be purchased soon. A good source is Kentucky preconditioned (CPH-45) calves which are immunized and have been preweaned and "boostered".
- Plan your receiving program. Weanling calves undergo a great deal of stress associated with weaning, hauling, marketing, and wide fluctuations in environmental temperature at this time of year. Plan a program which avoids stale cattle, get calves consuming water and high-quality feed rapidly. Guard against respiratory diseases and other health problems.

General

- Always keep a good mineral mix available. The UK Beef IRM Basic Cow-Calf mineral is a good option.
- Do not give up on fly control in late summer, especially if fly numbers are greater than about 50 flies per animal. You can use a different "type" of spray or pour-on to kill any resistant flies at the end of fly season.
- Avoid working cattle when temperatures are extremely high – especially those grazing high-endophyte fescue. If cattle must be handled, do so in the early morning.
- Provide shade and water! Cattle will need shade during the hot part of the day. Check water supply frequently – as much as 20 gallons may be required by high producing cows in very hot weather.
- Plan the winter-feeding program. Take forage samples of hay you will feed this winter. Request of full nutrient analysis so that supplemental feed needs may be estimated. Don't wait until you run out of feed in February to purchase extra feed. Plan to minimize hay storage and feeding losses because feed is too expensive to waste.
- If you have adequate moisture, stockpiling fescue might be a viable option. Nitrogen application to fescue pastures can be made now and allow them to grow and accumulate until November, or when other sources of grazing have been used up. To make best use of this pasture, put fall-calvers, thin spring-calvers, or stockers on this pasture and strip graze.
- Don't graze sorghum or sudan pastures between the first frost and a definite killing frost because of the danger of prussic acid poisoning. Johnsongrass in stalk fields can also be a problem after a light frost. Grazing can resume after the sorghum-type grasses have undergone a killing frost and dried up.

Information for Beef Bash

Tyler Purvis, Beef Extension Associate, Univeristy of Kentucky

It's that time of year again! Beef Bash will be held Thursday, September 21st from 2 p.m. to 8 p.m. at the C. Oran Little Research Center. Dinner will be provided by the Woodford County Cattleman's Association at 5 p.m. Pre-registration for attendees will be $15 and includes a meal ticket. Come out to see all the latest UK research, interact with extension specialists, and browse a variety of vendors.

Beef Seedstock Symposiums Set for October

Dr. Darrh Bullock, Beef Extension Professor, University of Kentucky

University of Kentucky Beef Extension in partnership with the University of Tennessee Cooperative Extension will be conducting a Beef Seedstock Symposium on October 17 (Fayette County Kentucky Extension Office, Lexington), October 18 (Barron County Kentucky Extension Office, Glasgow) and October 19 (Middle Tennessee AgResearch and Education Center, Spring Hill). This program is specifically designed to assist beef cattle seedstock producers that market bulls to commercial and/or other seedstock producers. There will be a major focus on genetics (EPD, genomics, indexes), but we will also cover topics on nutrition, health, bull fertility and marketing strategies. Speakers from the University of Kentucky, the University of Tennessee, and our featured speaker Dr. Matt Spangler from the University of Nebraska will cover these topics. The cost is $25 to attend, and pre-registration is required (space is limited). Lunch and educational resources will be provided. To receive a flyer, a detailed agenda, and a mail in registration form you can email Maggie Ginn at Maggie.Ginn@uky.edu or you can go directly to the registration site (links below) to see the agenda and register with a credit card if interested. The Kentucky portion of this program is in coordination with the Kentucky Beef Network and funding was generously provided by the Kentucky Agricultural Development Fund.

Lexington: https://www.eventbrite.com/e/709667262887?aff=oddtdtcreator

Glasgow: https://www.eventbrite.com/e/709673651997?aff=oddtdtcreator

Spring Hill: https://www.eventbrite.com/e/709676941837?aff=oddtdtcreator

Beef Quality & Care Assurance Chute Side Training

Maggie Ginn, Beef Extension Associate, University of Kentucky

Join us for a free Beef Quality & Care Assurance Chute Side Training on September 12th at Kentuckiana Livestock Market in Owensboro. A meal will be served at 5:30 and training will begin at 6 pm. Please pre-register by September 8th by calling the Daviess County Extension office at (270) 685-8480 or by emailing chardy@uky.edu. There are only 60 spots available so please register soon for this opportunity. For more information please go to University of Kentucky Beef Extension Facebook Page.

Are Internal Parasites Stealing Profit? Particpate in a Field Study

Jeff Lehmkuhler, Extension Professor, University of Kentucky & Michelle Arnold, Associate Professor, University of Kentucky

Internal parasites have been shown to impact animal performance and immunity. In research trials, weaning weights of calves burdened with internal parasites have been shown to be 20-35 pounds lighter. We are looking to learn more about the prevalence of internal parasites as well as the efficacy of products available on the market. Most of the anthelmintic products for livestock have been on the market for decades and concerns regarding their effectiveness have been mentioned. We need your help!

A joint effort between Merck Animal Health, Kentucky Beef Network and Kentucky Cooperative Extension is looking for 100-120 farms to participate in a Fecal Egg Count Reduction Test (FECRT) in

beef cattle this fall. Several producers participated in the effort this spring and will participate again this fall. We are looking for an additional 20-30 farms.

Who can participate?

We are looking to gather more information on growing cattle this fall. This includes calves that will be weaned and held for at least 14 days, backgrounding/stocker operations that are buying in calves this fall, and those developing heifers for replacements. We can sample mature cows as well if you have them on the farm.

How many animals are needed?

There must be at least 20 animals in a group. These animals must stay together in a group for at least 14 days after they are dewormed. We cannot collect samples from 15 calves and 5 cows to reach the 20 samples needed.

What's involved?

Fecal samples need to be collected from at least 20 different animals immediately before being treated for internal parasites. Then exactly 14 days later, 20 fecal samples from different animals are collected to examine the difference in fecal egg counts between PRE and POST treatment. Samples can be grabbed from freshly excreted fecal pats in the pasture, this works well for POST samples. Samples are sent to the lab for counting and results are sent to you/your agent.

What does it cost?

Nothing, the service is free except for your time and the money spent to purchase the product you will use. Since we are not purchasing product, you can use any product of your choice.

What do I do next if I am interested in participating?

Contact your county Extension office and speak to your Agriculture & Natural Resource Agent if you wish to participate at least three weeks before you plan to work cattle. If your county ANR position is vacant, contact Dr. Jeff Lehmkuhler for additional information at jeff.lehmkuhler@uky.edu

Future of Beef Production May be Up in the Air

Jeff Lehmkuhler, Extension Professor, University of Kentucky

A couple of weeks ago, the national meeting of the American Society of Animal Science was held. This is a professional organization that many of us in the animal sciences field are members of for professional development. Several of us from the University of Kentucky attended to present research, learn about on-going research, teaching and extension activities from other states and receive awards. In my opinion, the impact of animal agriculture on climate change is a key focus of current research at many institutions. In a search of the agenda, 25 presentations and 23 posters were presented when I conducted a search using the term methane. Let me put that in context, when I searched using just the term antibiotic, only 9 presentations and 7 posters were found. Though a variety of information was

shared covering numerous topics, the number of papers focused on the impact of animal agriculture on climate change couldn't be ignored.

In an invited presentation, Dr. Al Rotz, USDA researcher, shared information related to greenhouse gas emissions (GHG) from beef cattle operations. This team published a life cycle assessment for GHG for beef cattle in 2019 and a comprehensive assessment in 2023 that was partially funded by Beef Checkoff dollars. The authors reported the model estimated the current amount of feed required to produce 1 kg (2.2 lb) of carcass weight of beef was approximately 22 kg (44 lb). This is a feed conversion efficiency of 22:1 while you often hear of feed efficiency rates of 5 to 6:1 for live weight gain in the feedlot sector. Using 62% dressing percentage, a 6:1 feed-to-gain ratio would be roughly 10:1 if we expressed it on a carcass weight basis. Automatically, you should be getting red flag warnings and calling this work BS. However, this was a full life cycle assessment, womb to tomb if you will. The authors point out that the cow-calf sector accounts for nearly 73% of the feed inputs in the beef production system while the stocker/background and finishing phases accounted for 10% and 17%, respectfully.

Dr. Rotz in his presentation stated that beef production accounts for approximately 3.5% of the national GHG emissions. Their work further reported on emissions, energy and water use as well. The cow-calf sector was shown to contribute roughly 77% of the methane emissions. Beef animals are essentially walking fermenters, consuming forage and feed in which ruminal organisms get the first opportunity to ferment producing carbon dioxide, methane, ammonia and other compounds. This is what makes cattle unique in that they can utilize feeds that are non-edible by humans and convert these into high quality protein. The authors further broke down the beef systems by region. The southeast was reported to have the greatest weighted average GHG emissions.
As part of the Paris agreement, the United States committed to reducing GHG by 50-52% by 2030. With respect to agriculture, the 2021 US Long Term Strategy document discusses the protection and increase of forested areas. Data reported by EPA indicate that beef cattle emitted 22% of the total agricultural GHG emissions. The increase in practices that are referred to as "climate-smart" which includes the use of cover crops and rotational grazing as examples will receive greater emphasis in the future.

In Rotz's presentation in Albuquerque, he shared that food waste accounted for 20-30% of the GHG emissions in the U.S. which exceeded the proportion from beef production system of 3.5%. The global food waste contribution to GHG emissions reported by FAO using 2011 estimates was 3.3 gigatonnes of cabon dioxide equivalents (GtCO2e). In their recent 2023 publication, Rotz and co-authors state "The magnitude of this impact makes waste (food) one of the greatest impacts on environmental sustainability." Consider all the inputs to produce food are accounted for in the production chain and when food is wasted carbon emissions still occur. How much food is thrown out in your household, large community gatherings or when we dine out? How many vegetables and packages of meat are tossed from the grocery stores due to exceeding expiration dates? Food waste is also a distribution challenge on a global scale.

For nearly a decade, we have been hosting the Kentucky Beef Efficiency Conference. The information shared directly relates to our ability to reduce GHG and global warming potential (GWP) by the beef

industry. Remember the cow-calf sector is the greatest contributor to GWP in the beef system. Combining knowledge with management change to reduce waste is a first step.

Waste in my mind is equal to production losses. Redirecting our focus to increasing beef produced per unit of land will be needed. Additionally, the cow-calf sector will need to focus on increasing pounds of beef weaned per cow exposed. I am not advocating for maximizing, but rather optimizing. Increasing reproductive rates and weaning percentage should be an initial focus. Many factors contribute to these areas. Conducting breeding soundness exams, pregnancy checking to reduce feed inputs to non-productive cows, and improving our forage base to maintain body condition on cows to ensure breeding and increasing stocker performance will aid in reducing beef's carbon footprint. Reducing death losses through improved immunization is a very simple step. Where possible pasture renovation to novel endophyte tall fescue or interseeding clover will improve forage utilization and reduce GHG per pound of beef produced. There are several management tools in our toolbox that play a role in reducing the climate impact of beef production. These steps will also improve financial sustainability in the long run.

Making strides forward now as an industry will reduce the chance of policy intervention. The tabloids are full of European headlines discussing meeting climate change goals through the reduction of animal populations. Becoming informed and knowledgeable on sources of GHG emissions will also aid you in discussing with consumers what you are doing to reduce your carbon footprint and what they can do as well. How we will progress as an industry to lessen our GWP remains up in the air for now, but you can be assured this will not be going away anytime soon.

Don't Miss Opportunities in this High Market

Kevin Laurent, Extension Specialist, Department of Animal and Food Sciences, University of Kentucky

As we approach the end of summer and nighttime temperatures begin to consistently dip into the 60's our thoughts turn to fall activities, one of which is marketing our spring born calves. It's quite easy to feel good about the cattle business these days with current market prices, however we need to make sure we continue to manage our calf crop and do not miss the opportunities this current market is offering. Good management pays dividends in both lean years and good years. In fact, one could make the case that good management pays even greater dividends in times like these. The following are four management considerations that will help maximize calf value at sale time.

Table 1 - Steer Price vs Bull Price

Weight	Steer Price	Bull Price	Discount	Discount
Lbs	$/Cwt	$/Cwt	$/Cwt	$/Head
375	260.00	260.77	0.77	2.89
425	260.58	251.87	-8.71	-37.02
475	259.59	247.18	-12.41	-58.95
525	252.83	234.74	-18.09	-94.97
575	258.39	232.02	-26.37	-151.63
625	252.18	219.98	-32.20	-201.25
675	249.34	213.89	-35.45	-239.29

KY Weekly Livestock Summary Monday Aug. 14, 2023

Avoid selling bulls. Table 1 compares steer and bull prices in Kentucky markets for the week of 8/6/2023 to 8/12/2023. As is usually the case, discounts for bulls increase as calves

move up in weight class. What is unusual is the severity of the current discounts. Bull calves weighing in the 500-600 lb weight range have historically taken a $10-12 per cwt. discount as compared to similar weight steers. However, the present discounts for that weight bull calf have been running in the $20+/cwt. range. As table 1 shows, during the week of 8/6/2023-8/12/2023 that amounted to $95-152 per head. Although it is best to castrate male calves prior to three months of age, the next best option is to castrate prior to weaning. Research also shows that if calves are castrated early and implanted, weaning weights will be similar to intact males at weaning. A good reason does not exist to leaving a male calf intact. Castration is something that must be done and should be done on the farm where the calf was born to avoid the most stress and add the most value.

Wean, feed, and take advantage of the current value of gain. Weaned lots of calves have been consistently selling at a premium to unweaned calves. Weighted average premiums in two recent CPH sales were $10.45/cwt over state average prices with premiums as high as $20/cwt for lighter weight heifers. But what is most promising is the current value of gain being offered in the marketplace. Table 2 shows the current value in dollars per head of each additional 100 lbs. of weight. By simply dividing that dollar amount by 100 you can calculate the maximum cost of gain that a feeding program must stay under to be profitable. You can see that there is an excellent opportunity to profitably add weight to calves, especially at the lighter weight classes. Lighter weight calves are also cheaper to feed and have a lower cost of gain than bigger calves due simply to less feed needed for body maintenance. Backgrounding/preconditioning budgets using $300/ton feed, $90 hay, 8% interest, and $15/head health costs along with 2-2.5 average daily gains are currently showing cost of gain figures of approximately $1.10/lb. for 375-575 lb. calves to upwards of a $1.50/lb. for 775-875 wt. cattle. Realize, these price figures are from the non-valued added portion of the market report and do not represent any premium for weaning. The best way for small producers to capture weaned calf premiums is to sell in special preconditioned sales such as CPH or other stockyard sponsored sales. Combining a weaned calf premium with a feeding program that captures current value of gain leaves room for a potential significant profit.

Table 2 - Value of each additional 100 lbs of gain

Weight	Steer Price	Steer Price	Additional Value	Max. Cost of gain
Lbs	$/Cwt	$/Head	$/Head	$/lb
375	260.00	975.00	-----	-----
475	259.59	1233.05	258.05	2.58
575	258.39	1485.74	252.69	2.53
675	249.34	1683.05	197.30	1.97
775	230.28	1784.67	101.63	1.02
875	233.06	2039.28	254.61	2.55

KY Weekly Livestock Summary Monday Aug. 14, 2023

Consider a pre-weaning working. Working calves prior to weaning has always been a standard recommendation, especially for calves that were going to be retained on the farm through a pre-conditioning program. With current market prices, this may be a profitable strategy even for calves that will be sold off the cow. Virginia Tech research showed a 10-40 lb response in added weaning weight by deworming and implanting calves in mid-summer. If it is early September and we know we will not sell for another 45-60 days (about 2 months) it may pay dividends to deworm, implant and boost fly control now. If these practices add an additional 20 lbs of sale weight given the current market prices, a $10 investment may net a $40 return.

Avoid excessive sale day shrink. Sale day shrink is simply a cost of doing business. Anytime we move or haul cattle we can expect at least a 2-3 % reduction in weight primarily due to fill. However, with every pound worth $2+ dollars, reducing excess shrink needs to be a consideration. Oklahoma State research showed that unweaned bawling calves hauled to the sale barn the night before sale day shrank approximately 2% more than similar calves delivered on sale day. Sometimes delivering calves the night before a sale cannot be avoided but be mindful that a fresh weaned bawling calf in a hay and water pen at the yard the night before the sale is not going to eat or drink very much, if at all. Some other considerations to reduce shrink are to improve facilities so cattle can be sorted and loaded quietly and efficiently just prior to hauling. Also consider hauling calves early to the yard to avoid long waits in line to unload. Although excessive shrink should be avoided, overfilling calves should also be avoided. Selling calves that are deliberately overfilled is not fair to buyers and can also affect the health of calves in transit. Most of the time this strategy backfires on the seller in the way of price discounts.

How ever you plan to market your calves this year, prices should be favorable. But there is nothing wrong with trying to maximize value and get paid a little extra for all your hard work and efforts.

The BVD Virus in Cow/Calf Operations Part 1- What does it look like and where did it come from?

Dr. Michelle Arnold, UK Veterinary Diagnostic Laboratory

"BVD" or "Bovine Viral Diarrhea" virus is one of the most common and costliest viruses affecting KY cow/calf herds and backgrounding operations. Control of the BVD virus is best accomplished through implementation of three equally important practices: 1) surveillance testing to detect and remove infected cattle, 2) vaccination to increase herd immunity and 3) implementation of biosecurity measures to reduce virus entry into the herd. But how would a producer know that BVD virus is circulating in his or her herd? This article, the first in a two-part series, is written to help understand how BVD virus enters a beef herd and how to recognize its effects, and targets for control. Part 2 will address diagnostic testing strategies, how to correctly interpret results, and how to implement BVD virus measures.

One of the initial problems with this virus is its name. Although BVD stands for "Bovine Viral Diarrhea", rarely does an animal show any symptoms of diarrhea. Instead, cow-calf producers may observe one or more of the following disease manifestations in the herd:

1. Poor reproductive performance despite females in good body condition and fertile bulls.
    a. More open cows-Producers may find a decrease in overall pregnancy rate, including a reduced percentage confirmed pregnant after the first service. This infertility and "delayed breeding" are often blamed on the AI technician, a dud bull, hot weather, or fescue when it is actually the BVD virus causing failure to conceive and early embryonic death.
    b. Fewer live calves- BVD virus infection during pregnancy may result in abortions, mummies, stillbirths, neonatal deaths, and weak newborns that die shortly after birth.

2. Physical abnormalities including “dummy calves” that cannot nurse, eye defects, and cleft palates in newborns if dams are infected with the virus during mid-pregnancy.
3. An increased number of calf death losses pre-weaning due to pneumonia or scours.

It is important to realize that BVD virus in a herd may not have easily recognizable “classic signs” such as an increased number of abortions or birth defects. It may simply look like fewer mature cows pregnant at pregnancy check, finding cows open that should be calving, or more disease and death loss in pre-weaned calves than usual.

There are two types of BVD virus infection described in cattle; 1) “acute” or “transient” infection and 2) “persistent” infection (PI). An acute BVD viral infection usually lasts 10 days to 2 weeks and symptoms may range from severe to unnoticed, depending on the age of the affected animal and its level of immunity. In an adult unvaccinated (or poorly vaccinated) animal, the virus typically does not cause outward signs of sickness. However, the virus attacks reproductive tissues (ovaries of females, testes in males) resulting in infertility. Bulls may experience prolonged testicular infections. In pregnant cattle, the virus crosses the placenta to the developing embryo or fetus, causing several types of reproductive wastage or malformations, depending on the stage of fetal development when infection occurred.

Acute BVD virus infection in a susceptible calf may result in disease manifestations ranging from mild to severe disease and death. The BVD virus first attacks the immune system where it destroys the production of disease-fighting white blood cells, causing severe immunosuppression. Secondly, it can work synergistically with other viruses to make them more aggressive and deadly. This combination attack results in increased disease and mortality risk in pre-weaned calves exposed to the virus and a substantial risk of respiratory disease and death loss in calves post-weaning.

As mentioned previously, the outcome of acute BVD infection in the cow herd may be observed by a producer as infertility, delayed breeding, abortions, malformed calves, and neonatal death loss. Acute BVD virus infections in pre-weaned calves are recognized by the increased amount of sickness and death loss. What cannot be observed is the 2nd type of BVD infection, the development and birth of persistently infected (PI) calves. If an unvaccinated pregnant cow or heifer is infected with the BVD virus between 42-125 days (about 4 months) of gestation, the virus crosses the placenta and infects the fetus during a critical stage in its immune system development. The virus incorporates itself into the developing fetus, so the immune system does not recognize the virus as a foreign invader. When this calf is born, it is “persistently infected” with the BVD virus (known as a “PI” calf) and is a lifetime “carrier” and “shedder” of massive amounts of virus particles from all its bodily fluids including saliva, nasal discharge, feces, and urine. Those PI calves that survive past sexual maturity will also shed virus particles in milk, semen, uterine secretions, and aborted membranes. A PI cow will always have a PI calf although less than 10% of PI calves come from PI positive dams. One PI calf born on a cow/calf operation usually means there will be additional disease problems within that calf crop. Any fetus infected with BVD later in gestation (150 days (about 5 months) or more) while in the uterus will not become a PI but still will not be “normal”. The virus commandeers certain cell types to produce more virus particles that would normally be used for critical fetal development. This results in destruction of endocrine tissue and may destroy 20-80% of the thymus gland, an important driver of immune function in young calves. These calves will have increased respiratory disease, poor growth and performance, and

if they reach sexual maturity, more reproductive issues. Therefore, the reason pre-weaned calves in the same field with a PI calf typically exhibit more sickness and death loss (scours, "summer pneumonias") is two-fold; 1) due to ongoing immune system suppression from constant BVD virus exposure coming from the PI calf and 2) due to a damaged immune system from BVD virus infection while *in utero*.

The key to transmission of the BVD virus within and between herds and virus persistence year after year is the PI animal. Ingestion or inhalation of the virus by direct contact with body fluids or aerosols from PI cattle are the main and most important source for BVD virus transmission. In addition, any virus deposited in watering troughs, feed troughs, round bales of hay, cattle trailers-virtually everywhere the PI animal goes-can be picked up by the other cattle in the herd, either by mouth or nose. Importantly, a PI calf shedding virus in the pasture during breeding season will expose many (if not all) of the cows/heifers to the virus during the highest risk time for *development of the next generation of PI calves* that will be born during next year's calving season. Acutely infected cattle shed virus particles too but at a significantly lower rate and shorter length of time. A normal calf infected with the BVD virus sheds approximately 10,000 virus particles per day and recovers in 10-14 days. In comparison, a PI calf sheds 10 MILLION virus particles every day of its life. This is why detection and removal of PI animals is crucial to BVD virus control.

Once a producer receives the diagnosis of BVD virus infection in the herd, the first question asked is how did it get here? **Research has proven that the #1 cause of BVD virus entering a herd is through the purchase of pregnant females, especially first calf heifers, without properly testing for the virus. The testing strategy must include testing every purchased pregnant female for BVD and also testing her newborn calf for "PI" status.** It is not enough to test the dam and ignore her unborn calf because it may not have the same BVD status as its dam and cannot be BVD tested until it is born! It is recommended to calve out purchased pregnant females away from the home herd and test their calves for BVD virus as soon as possible. In addition, don't allow these cow/calf pairs to have contact with the home herd until each new cow and her calf has a BVD negative test result. **Although a pregnant cow tests negative for BVD, always bear in mind she can still be carrying a persistently infected ("PI") calf that will test positive. Over 90% of PI calves are born from BVD negative dams.**

All newly purchased cattle, regardless of age or pregnancy status, should be tested for BVD-PI, vaccinated appropriately, and isolated away from the home herd at least 2 weeks. Other sources of the BVD virus in a cow/calf herd include introduction of new breeding bulls, a calf purchased from a sale to graft on a cow, or feeder calves purchased at auction and brought home to the farm have the potential to be acutely or persistently infected. Even show cattle that are vaccinated and have tested negative for BVD-PI may become acutely infected with the virus and can bring the virus back when they return from fairs and exhibitions. This is why quarantine for all animals arriving to the farm away from the home herd for at least 2 weeks with no nose-to-nose contact or shared water sources is crucial to preventing virus spread. In the same manner, herds with fence line contact with feeder calves or other cattle frequently traded may result in exposure to the BVD virus if allowed to touch noses or share water. There are other minor sources of transmission including fomites (needles, OB sleeves, nose tongs) and vectors including stable flies and horse flies. Other species including sheep, pigs, alpacas, deer, and goats can also carry the virus to cattle.

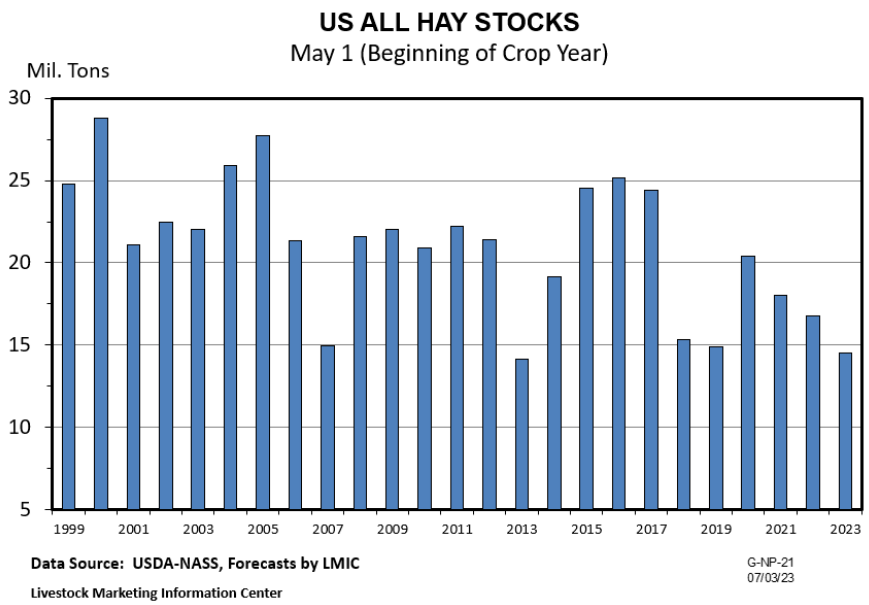
Although vaccination is a key component in BVD virus control, just vaccinating the herd annually without practicing excellent biosecurity and surveillance for PIs will not keep this virus from gaining entry to the farm. Vaccines against BVD virus (including those with Fetal Protection claims or "FP" vaccines) will reduce the chance of fetal infection and PI development but this is an extremely high bar for any BVD vaccine to achieve. The question of whether to use modified live or killed vaccine is not an easy one to answer. Many popular beef magazines offer articles concerning what types of vaccines work "the best" or are "safest" according to the latest research. The truth is, there are tradeoffs when it comes to vaccine selection. Modified live vaccines (MLVs) offer better and more effective pregnancy protection but the IBR portion of the vaccine can impact conception rates if given too close to breeding season. If using timed artificial insemination (AI), experts recommend administering MLV vaccines at least 45 days pre-breeding to allow 2 estrus cycles prior to insemination. In addition, MLV vaccines can cause abortions if given to pregnant cattle without strict adherence to label directions. Killed vaccines, on the other hand, are safer but are not as good at preventing fetal BVD infection. A herd with excellent biosecurity and at exceptionally low risk can err on the side of safety and use killed vaccine. However, herds that purchase animals including replacement females and/or bulls, herds near stocker cattle or unvaccinated neighboring cattle, show cattle herds, herds with frequent deer contact, or any other probable exposure should err on the side of efficacy and choose modified live. If breeding occurs year-round so MLVs are not an option, an alternative is to administer two doses of MLV vaccine to open heifers (at weaning and a second dose 6 weeks prior to breeding) with annual revaccination using a killed vaccine. This combination stimulates excellent protection without the risk of MLVs although this protective response will diminish after several years. Finally, and perhaps most importantly, cattle herds are unique entities with different risks for disease on every farm so work with a veterinarian to choose the right vaccines for the herd.

August Hay Production Estimates Are Encoruaging, but Variation Still Exists

Dr. Kenny Burdine, Livestock Marketing Specialist, University of Kentucky

USDA's August Crop Production report serves as an initial estimate of the size of the year's hay crop and includes state-by-state estimates. This has implications for winter feed supply and winter feed costs for cattle operations. This year's hay crop will be especially important following the widespread drought across much of the US last year. Estimated May 1 Hay stocks were down by more than 13% nationally this spring (see figure below), which was driven by a combination of the small hay crop last year and a large number of hay feeding days last winter. Like any estimate, a lot can still happen for the remainder of the growing season, but it does provide some perspective on what can be expected from hay supplies going into fall.

For this discussion, I will focus on what USDA refers to as all other hay. In most states, this means that Alfalfa and Alfalfa mixes are excluded. I am simply doing this since that is the category that is most associated with winter feeding implications for cow-calf operations. At the national level, all other hay production is estimated to be up by 8% from 2022 as a result increased acreage and yield. Certainly, this is encouraging and suggests improved hay supply is likely at the national level. But hay is a unique product with high transportation costs, so markets tend to be very localized. For this reason, hay prices



can vary a lot from one area to the next. While overall conditions are better this year, there are still large cattle producing areas that are dealing with drought.

In the table below, I selected some state-level all hay production estimates from the August report. Hay production was projected to be higher in Arkansas and Kentucky, while being down a bit in Mississippi. I also included Tennessee as another state in the Southeast, where hay production is projected to increase by nearly 10%. Beyond the Southeast, I included some states of interest due to the scale of hay production or the change from last year. Missouri stood out with an estimated decrease in production of more than 20%. After significantly reduced production levels last year, Oklahoma and Kansas stood out for the opposite reason, with projected increases of 60.3% and 17.6%, respectively. Texas is the largest hay producing state in the US and is projected to produce over 12% more hay in 2023.

The August Crop Production report serves as an important reminder of how different production can be across states and even within individual states. Further, conditions are constantly evolving and fall weather will impact production levels and hay feeding days this winter. While discussing USDA's estimates provides some context, the real message is that producers should already be making plans for their winter hay needs. It's never too early to assess likely hay needs for the upcoming winter and make certain that a sufficient supply is available.

Non-Alfalfa Hay Production Estimates in Selected States and US (2022 and 2023)

State	2022 Production (1,000 tons)	Est. 2023 Production (1,000 tons)	Change from 2022 to 2023
Arkansas	2,180	2,320	+6.4%
Kansas	3,315	3,900	+17.6%
Kentucky	4,224	4,680	+10.8%
Mississippi*	1,180	1,140	-3.4%
Missouri	5,490	4,350	-20.8%
Oklahoma	3,500	5,610	+60.3%
Tennessee	3,570	3,916	+9.7%
Texas	6,150	6,900	+12.2%
United States	64,843	69,894	+7.8%

*Mississippi Estimates include Alfalfa and Alfalfa Mixtures
Source: USDA-NASS August Crop Production Report