COOPERATIVE EXTENSION SERVICE
UNIVERSITY OF KENTUCKY COLLEGE OF AGRICULTURE, FOOD AND ENVIRONMENT, LEXINGTON, KY 40546

OFF THE HOOF

Kentucky Beef Newsletter April 2017

Published Monthly by Dr. Les Anderson, Beef Extension Specialist, Department of Animal & Food Science, University of Kentucky

Contents

This month's newsletter includes:

Timely Tips

Dr. Roy Burris, Beef Extension Professor, University of Kentucky

Spring Calving Cow Herd

- *Prevent grass tetany!* Provide magnesium in the mineral mix until daytime temperatures are consistently above 60°F. Mineral supplement should be available at all times and contain a minimum of about 14 percent 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.
- Watch cows and calves closely. Save every calf (you can cull/sell them later). Calves can be identified 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. Don't let them lose body condition.
- Don't "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!
- Make final selection of heifer replacements. Consider vaccinating with a modified-live BVD vaccine.
- Purchase replacement bulls at least 30 days prior to the start of the breeding season. Have herd bulls evaluated for breeding soundness (10-20% of bulls are questionable or unsatisfactory breeders). Get all bulls in proper condition for breeding.
- If you are going to use artificial insemination and/or estrus synchronization, make plans now and order needed supplies and semen.
- Prebreeding or "turn-out" 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. Make arrangements now for products needed and have handling facilities in good working order. Dehorn commercial calves before going to pasture.

Fall Calving Cow Herd

- You may let calves creep-graze wheat or rye, if it is available. Calves will benefit from extra feed until spring grass appears.
- Consult with your veterinarian about a preweaning working of the herd.
- Pregnancy check cows now and cull open ones at weaning.
- Reimplant feeders.
- Plan marketing strategy for feeder calves.

Stockers

- "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 which are used in rotational grazing.
- Don't go to pastures too soon, give plants some growing time. Then stock at two to three times the July rate and rotate rapidly.
- Provide a good mineral supplement which contains a rumen modifier (Rumensin, Bovatec, etc.) along with adequate levels of copper and selenium. The UK Beef IRM Stocker mineral with Monensin will work well in this case.

General

- We've made a muddy mess this winter, so be prepared to reseed bare spots.
- 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's time to re-stock.
- 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.
- Plan now for fly control ... decide what fly control program that you will use but don't put insecticide eartags on cattle until fly population appears.

Longevity in the Cow Herd

Dr. Roy Burris, Beef Extension Professor, University of Kentucky

Longevity can be defined many different ways by beef producers. However, I'll just use the definition – how long a beef cow or bull stays in your herd. They may leave your herd for a variety of reasons but every time it happens it represents a significant expense to your operation. This is generally the difference in their salvage value and what it costs to replace them. However, you could possibly be replacing an inferior animal with one that is more profitable. That is what we hope for.

A cow doesn't have to be highly productive to stay in the herd. Longevity might simply be due to the absence of problems. Everyone probably has different reasons and different levels of tolerance for culling cows and bulls in their herds. My philosophy is probably a little different, too. Most often, cows are culled for reproductive reasons. You don't have to be a "rocket scientist" to figure out that open cows don't make any profit. I always cull cows that are open (nonpregnant) at "preg checking" time. We can argue that it might be more economical to keep a barren cow a year than to purchase a replacement heifer but I choose to keep pressure on the cow herd to be productive. Reproduction isn't a highly heritable trait but selecting cows and heifers that are productive in our particular environment is a good long-term goal.

One of the first things that effects longevity in our herd is disposition. I believe in eliminating problems as soon as they appear. A crazy cow or bull is a liability and needs a dose of "trailermycin"! Calves are evaluated every time they go through the chute and bulls are selected based on their disposition (or docility scores). Docile animals generally perform better and create fewer problems. Thus, docility does affect longevity. There are enough things that can go wrong in your cow herd without selecting rogue animals.

How long should a good cow stay in the herd? I love getting heifer calves out of old commercial cows and both bull and heifer calves out of old purebred cows. If a cow calves every year and is in her "teens", she is special. I want to keep her as long as I can – but she needs to still have some salvage value and be suitable for marketing. I remember two Brangus cows in our herd here – G5 and G6. G5 was a nice specimen and went directly into the "purebred" group. G6 was not as good looking (to me) and went into the commercial herd. After a few years, G5 was gone but G6 had bred on the first heat every year. She then went into the purebred group and we still have bulls and cows that are her descendants. "Broken" or "smooth-mouthed" animals need to be evaluated but as long as they are pregnant and in good body condition, it is great to generate one more heifer from that "ole cow".

Udder problems will get cows on our list, too. We select for clean, tight udders with small teats and cull those that are appear to be problematic. Heavy milking cows with pendulous udders and large teats are difficult for a newborn calf to nurse and that initial intake of colostrum milk is critical to their health. These udders also tend to be "dirtier" and can cause more scours. I don't care to "milk-out" cows when they calve – you are just perpetuating a problem.

Eye problems (like cancer-eye) and any type of lameness will also cause problems and affect longevity. Be on the look-out constantly (especially in bulls) for abnormal hoof growth (like screw-claw). These problems seem to appear frequently now days and should be culled for and selected against. Lack of production, poor production or inferior quality of calves can be reasons for culling cows and bulls.

I am of the opinion that your best source of breeding stock (other than your own herd) is from producers that have been vigilant over many years in culling rigorously and selecting problem free animals. When purchasing a new bull this spring, ask to see his grandmother. If she is still in the herd after several years, his odds are better too. Longevity and "stay ability" are traits of economic importance in our cow herds.

IRM Farm Program Producer Highlight: B. Hamilton

Ben Crites, IRM Coordinator, University of Kentucky

The UK IRM team has developed the IRM Farm Program, which is designed to increase the use of production practices that favor high reproductive rates in the cowherd. This program is delivered through on-farm learning to demonstrate the benefits of implementing these production practices. This spring marks the beginning of the third year for the program. To date we have 97 producers from 35 counties participating in the program. The results from these producers have been promising and we look forward to continuing to work with these cooperator herds.

Of the 97 producers participating, Mr. Hamilton has been a part since the very beginning of the program, starting early in 2015. Mr. Hamilton resides in Bracken County and runs a small herd of Limousin-influenced cattle. Initially, Mr. Hamilton did not have a defined calving season and ultimately wanted a fall-calving season beginning mid-September. Our first step was to remove the bull from the cowherd until we wanted the breeding season to begin. This eliminated the possibility of having calves born in the spring of 2016.

In the first year of the program, the cows that calved in the spring of 2015 were held open until the fall breeding season. In 2015, only 56% of the cows calved in the desired window. Six "done" cows were sold in 2015 for various reasons that included: age, feet/leg problems, and not having a calf. Two open replacement heifers were

purchased as well. Mr. Hamilton was also interested in the benefits of using estrous synchronization and AI. In the first breeding season in the program, 12 cows were bred using a timed-AI protocol. He had one late-calving cow that received a CIDR device to help move her up in the calving season. Half of the females conceived to the AI, 12 of the 13 cows had and weaned a calf, and 100% of the herd calved in the desired window. The calving season took place in a 60-day window, beginning September 9th and ending on November 11th. When we look at the increase in weaning weight per cow exposed to the bull, from 2015 to 2016, an increase of 88 pounds (311 lbs to 399 lbs) was observed. Using the current market value (average of steer and heifer) for a 300 lb calf ($155/cwt) and 400 lb calf ($146/cwt), this 88-pound increase equates to an additional revenue of $119 per cow.

In 2016, Mr. Hamilton added five replacement heifers, increasing his herd size to 18 total breeding age females. Pleased with the first year results, Mr. Hamilton wanted to implement estrous synchronization and AI again in the fall of 2016. Based upon the pregnancy diagnosis information from this spring, 17 of the 18 females were confirmed pregnant and 75% conceived AI. Two cows that calved in November 2015, received a CIDR device before being exposed to the bull. Pregnancy diagnosis indicated that both females will calve in mid-October this fall. The estimated calving season length for fall 2017 is anticipated to be only 36 days based upon the pregnancy diagnosis. The results from Mr. Hamilton's operation over the last two years are depicted in the table below.

In summary, the calving season length was shortened from 342 days to 60 days, to now an expected 36 days. This reduction in calving season length was possible through controlling exposure to the bull and also implementing an estrous synchronization program and AI. By reducing the length of the calving season we noticed an 88-pound increase in weaning weight per cow exposed, which equals an increase of $119 per cow with today's market value. The results from Mr. Hamilton's operation over the last two years are very encouraging and we are looking forward to see what the future has in store.

	2015	**2016**	**2017 (estimated)**
# Cows	17	13	18
# of Calves Born	16	12	17
Calving Percentage	94%	92%	94%
# of Calves Weaned	13	12	
% Weaned / Cow Exposed	76%	92%	
Total Weaning Weight (lbs)	5281	5184	
Wean Weight / Cow Exposed (lbs)	310.65	398.77	
Date of First Calf	1/14/2015	9/10/2016	9/8/2017
Date of Last Calf	12/22/2015	11/9/2016	10/14/2017
Calving Season Length	342	60	36
% Calving in Desired Window	56%	100%	100%
AI %		50%	75%

A Breeding Soundness Exam: Insurance for Your Breeding Season

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

I received the call on Monday. I seem to receive this call 6-8 times each year. This particular rancher had just finished getting his cows diagnosed for pregnancy. He had 43 cows falling calving cows. Last fall, these cows were synchronized for artificial insemination and were exposed to one bull for about 5 weeks and a second bull for 7 weeks. Only 22 cows conceived and all of them conceived to the AI. The first question I asked this rancher was the obvious one; did you get a breeding soundness exam (BSE) performed on your bulls? His

response; the bulls had one when he bought them but he had not had one done since (2-3 years). The bulls were checked and, sure enough, both were infertile.

What is a BSE? A BSE is a fertility exam performed on bulls by a veterinarian. A BSE has three components; scrotal circumference, a physical exam, and a semen evaluation. Scrotal circumference is highly correlated with semen output and serving capacity. It is recommended that a 12-13 month old bull have a scrotal circumference of at least 30 cm. The physical exam is performed to simply ensure that a bull is physically up to the challenge of the breeding season. Are his feet and legs structurally correct? Is he free from injury and/or infection? The veterinarian then examines the bull's semen to determine if the sperm cells are normal. The bull is then graded as satisfactory, unsatisfactory, or deferred. Bulls classified as unsatisfactory are considered infertile and it is not recommended that they be used for breeding. Bulls that receive the deferred classification had some irregularities in their ejaculate and a second collection is required to determine his fertility. A BSE is a highly reliable tool to use to identify bulls that are infertile.

Results from surveys nationally and in Kentucky indicate that fewer than 30% of cattlemen routinely subject their bulls to a BSE. I am amazed by how few people obtain a BSE in their herd bull before each breeding season. We purchase car, health, life, and crop insurance why wouldn't we purchase a little breeding-season insurance? We protect ourselves against most disasters but we don't protect our cow herd from the ultimate disaster? A BSE will cost $50-100 so it is a fairly inexpensive, easy form of risk management. I'm fairly certain that the cattleman that called me wished he had gotten a BSE on his bulls before he found out that he had 21 open cows. The $150 investment in breeding insurance (BSE) seems small compared to the lost income from 21 cows ($15-18,000). So protect your investment. Obtain a BSE on all your bulls 30 days before every breeding season.

Baleage Mistakes Can Lead to Major Health Consequences

Michelle Arnold, DVM (Ruminant Extension Veterinarian, UKVDL), Dr. Ray Smith, Livestock Forage Extension Specialist, and Krista Lea –UK Dept of Plant and Soil Sciences

Baleage or "wet wrapped hay" is simply forage of a relatively high moisture content that is baled with a round baler and then sealed in a plastic bag or wrapped in plastic, to keep oxygen out. Anaerobic bacteria (those that live without air) convert sugars in the forage to lactic acid which in turn lowers the pH and preserves the forage as silage, with full fermentation completed within 6-8 weeks. Round bale silage ("baleage") is an alternative to baling dry hay that allows shorter curing time and saves valuable nutrients by avoiding rain damage, harvest delays, spontaneous heating and weathering if stored outdoors. Grasses, legumes and small grains can be effectively preserved by this method but only if proper techniques are followed. Forages should be cut at early maturity with high sugar content, allowed to wilt to a 40-60% moisture range, then tightly baled and quickly wrapped in plastic to undergo fermentation ("ensiling" or "pickling"), a process that should drop the pH of the feed below 4.5 where spoilage organisms will not grow. Problems arise when conditions in the bale allow growth of disease-causing organisms and potentially fatal conditions in cattle.

Why do problems occur?

1. Forage cut at the wrong stage of maturity will not have enough fermentable carbohydrates for good ensiling. Coarse, stemmy and overly mature forages have less sugars available for completion of fermentation, especially once the seed head has emerged. Small grains including rye, oats, wheat, and barley have a narrow harvest window and should be cut before the boot stage.
2. Lower bale density makes round bale silage more susceptible to entrapment or penetration of oxygen and increases the chance of air pockets within the bale. Tight, dense bales wrapped with plastic twine, net-wrap or untreated sisal twine are less likely to spoil.
3. Baling at the incorrect moisture content is a recipe for disaster. Wet or non-wilted forages are more likely to spoil; bacteria from the *Clostridia* family thrive in wet environments where forage moistures

are in the higher 67-70% range. Greater than 70% moisture almost guarantees Clostridial growth and spoilage. Conversely, forage that is too dry does not ferment but has greatly increased mold production.

4. Baled silage is also more likely to spoil due to damage to the plastic covering, resulting in the harmful introduction of oxygen. It is important not to puncture the plastic; isolate the area from cattle, pests and vermin. Anything that claws, bites or otherwise punctures the plastic sets the feed up for spoilage.

What are the health risks to cattle?

1. Botulism is a disease caused by one of the most potent toxins known to man. This toxin is produced by *Clostridium botulinum*, a spore-forming anaerobic Gram + rod. These spores are found everywhere in the soil and contaminate baleage during harvest, often by raking up dirt. In the absence of oxygen (as is found in wrapped hay) and a pH greater than 4.5 (poor fermentation), the spores enter a vegetative state, multiply and produce toxin. Two forms of the toxin, Types B and C, are found most frequently in KY cattle. Type B is associated with improperly fermented forage while Type C occurs from the accidental feeding of dead animals or poultry litter in the ration of cattle. Both types produce the same characteristic clinical picture in cattle of progressive muscle weakness leading to recumbency (downers) over a 2-5 day period of time, depending on the amount of toxin ingested. Signs may develop as early as 24 hours to as many as 10 days after ingesting the toxin. Death is due to paralysis of muscles of the diaphragm, dehydration, or complications from being a "downer".
2. Listeriosis or "Circling Disease" is an encephalitis caused by the bacterium *Listeria monocytogenes*. This organism proliferates in soil, feces and rotting vegetation. It grows in cool temperatures and at a pH greater than 5.4 under anaerobic conditions. It thrives in baleage systems when limited fermentation and entry of air results in spoiled, moldy feed. Common places to find *Listeria* include spoiled silage at the end of trench silos, decaying forage at the bottom of solid feed bunks, and rotting hay or baleage. A very common mistake by producers is feeding too many bales at once. Baleage that sits out open to the air over several days will begin to rot and spoil, allowing bacteria and molds to proliferate. In order to produce clinical disease, *Listeria* must survive the fermentation process which it can easily do if the pH never goes below 5. Large numbers of bacteria may gain access to the body through the mucous membranes of the mouth (through small cuts) and travel up the nerves to the brainstem. Fever, anorexia (off feed), depression and neurologic signs develop depending on which cranial nerves are affected. Neurologic signs include leaning to one side, stumbling, circling in one direction, facial nerve paralysis, drooling, difficulty chewing, drooped lower jaw, and head tilt. Early intervention with antibiotic therapy is often successful but, if the cow goes down (becomes recumbent), the odds of survival are low despite aggressive treatment. The prognosis for sheep and goats with listeriosis is poor with an approximate 25% survival rate.

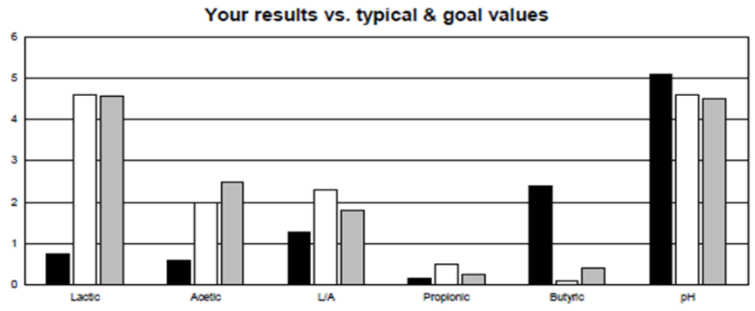
"Silage Eye" due to Listeria monocytogenes. Photo: http://www.nadis.org.uk/bulletins/eye-conditions-in-cattle.aspx

Infection with *Listeria* may also result in eye disorders and abortion. Anterior uveitis or "silage eye" follows conjunctival infection with *L. monocytogenes*. The symptoms are very similar to pinkeye with tearing, blinking, and sensitivity to light early in the course of disease followed by development of a bluish-white corneal opacity (see photo) then pus and dead cells accumulate just behind the cornea in the anterior chamber. Treatment with long-acting antibiotics should speed healing. Listerial abortion can occur at any stage of pregnancy. The route of infection is through

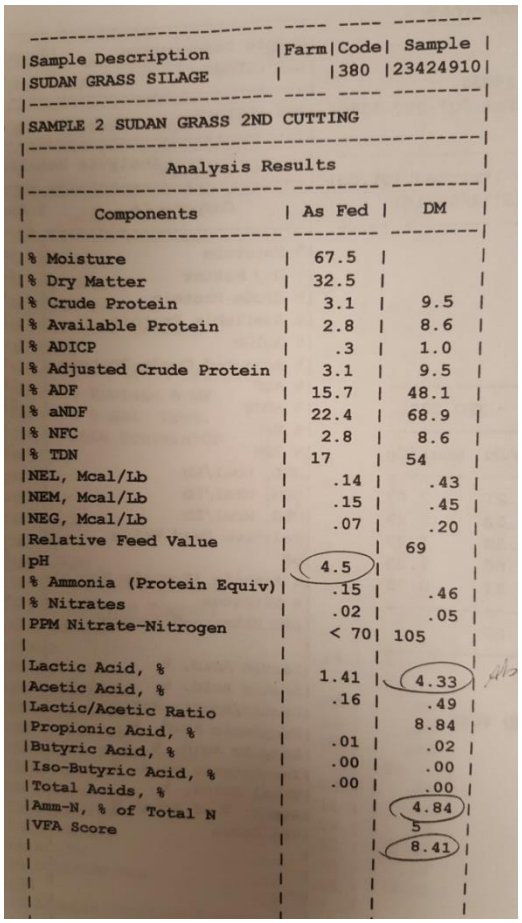
the GI tract into the bloodstream and then to the placenta causing fetal death.

3. Bacterial and fungal abortion is another possible consequence of poorly preserved forages. Forage baled and wrapped too dry provides excellent conditions for germination and growth of a variety of yeast, molds and bacteria. Fungal spores are spread throughout the body by the bloodstream after inhalation or ingestion. Germination and growth of fungal spores in the placenta results in abortion, typically in the last 1/3 of pregnancy. If submitted to a diagnostic laboratory, fungal lesions are almost always identifiable in the placenta. Not all molds are dangerous though; many bales will develop some white surface mold due to small holes in the plastic but it does not penetrate deep into the bale. This outer layer can be removed at feed out or the cows will usually avoid eating these areas. Bacterial contamination of baleage results in similar abortion risks. *Bacillus* species proliferate in poor quality silage and are partly responsible for deterioration when air is allowed in the bale. Bacterial abortion due to *Bacillus* species occurs when cows ingest the organism which travels through the bloodstream to the uterus followed by growth of the organism in the placenta and fetus. Cows abort in the last month of pregnancy or calves may be born alive but die within 24 hours.
4. Poor quality baleage, if not adequately supplemented, will lead to loss of body condition in late gestation and early lactation, poor milk production and poor fertility. The feed value of baleage is a function of forage maturity at harvest, baling, handling and storage. The best method to evaluate baleage is a forage analysis that includes a fermentation profile (see example). Important goals include pH<4.5 (definitely below 5), at least 2% lactic acid and greater than 5% total acids on a dry matter basis, and a volatile fatty acid score (VFA) above 5.

Component	DM Basis	Goal	Typical Value for DM Range 28 - 32
Dry Matter, %	28.05		
Lactic Acid, %	0.74	> 3	4.57
Acetic Acid, %	0.58	< 3	2.49
Lactic/Acetic Ratio	1.28	2.0 - 3.0	1.80
Propionic Acid, %	0.16	< 1.0	0.25
Butyric Acid, %	2.38	< 0.1	0.40
IsoButyric, %	0.08		
Total Acids, %	3.93	5.0 - 10.0	7.70
pH, As sampled	5.10	< 5	4.51
Crude Protein, %	9.42		
Ammonia, CPE %	1.27		1.51
Amm-N, % of Total N	13.46	8.0 - 15.0	10.54
VFA Score	< 1	6.0 - 10.0	



A fermentation report from Dairy One Forage Testing Lab (Ithaca, NY) on a sample of poor quality wheat baleage. Legend: The black bar=your results; white bar=Goal Value; grey bar=typical values Prevention is based on ensuring proper harvest and preservation of wrapped forages and maintaining proper feedout rates to reduce the risk of growth of organisms dangerous to cattle. Correct moisture content is of primary importance; there is a field method to assess moisture that will yield a general idea of moisture content but there are far more accurate methods available. Cut forage at the proper stage of maturity so it contains adequate levels of fermentable carbohydrates for good ensiling. See *Quality Hay Production* (AGR-62) for specific cutting recommendations for various forage crops http://www2.ca.uky.edu/agc/pubs/agr/agr62/agr62.htm. Also, achieving the highest bale density possible, especially with high internal core densities, removes the maximum amount of oxygen with few air pockets. Wrapping the bales quickly after baling with a good quality plastic, preferably with an ultraviolet inhibitor and 6-8mm thickness, and using multiple (4-6) layers will extend the storage time. Bale weight can be a safety and equipment issue. Details of proper techniques can be found in the UK Extension Fact Sheet AGR-173 entitled "Baling Forage Crops for Silage" at your local extension office or on the web at http://www2.ca.uky.edu/agc/pubs/agr/agr173/agr173.pdf. Another excellent resource is the UK Forage website for more information: http://www.uky.edu/Ag/Forage/ForagePublications.htm#Silage/Balage0 and look for



Sample Description	Farm	Code	Sample
SUDAN GRASS SILAGE		380	23424910

SAMPLE 2 SUDAN GRASS 2ND CUTTING

Analysis Results

Components	As Fed	DM
% Moisture	67.5	
% Dry Matter	32.5	
% Crude Protein	3.1	9.5
% Available Protein	2.8	8.6
% ADICP	.3	1.0
% Adjusted Crude Protein	3.1	9.5
% ADF	15.7	48.1
% aNDF	22.4	68.9
% NFC	2.8	8.6
% TDN	17	54
NEL, Mcal/Lb	.14	.43
NEM, Mcal/Lb	.15	.45
NEG, Mcal/Lb	.07	.20
Relative Feed Value		69
pH	4.5	
% Ammonia (Protein Equiv)	.15	.46
% Nitrates	.02	.05
PPM Nitrate-Nitrogen	< 70	105
Lactic Acid, %	1.41	4.33
Acetic Acid, %	.16	.49
Lactic/Acetic Ratio		8.84
Propionic Acid, %	.01	.02
Butyric Acid, %	.00	.00
Iso-Butyric Acid, %	.00	.00
Total Acids, %		4.84
Amm-N, % of Total N		5
VFA Score		8.41

Baleage:Frequently Asked Questions. Example below of great baleage!

Moisture Testers

Two types of forage moisture testers are available: one type utilizes heat and the other type utilizes electronics. Heat-type moisture testers consist of a heater/fan drying unit, a screen-bottomed sample container, and a simple spring scale. Moisture content is determined by filling the sample container with a fixed amount of wet forage and drying the forage to a constant dry matter percentage. The mass difference between the wet and dry forage is used to determine the initial forage moisture content. Most heat-type moisture testers require 25 to 35 minutes to operate.

Electronic moisture testers provide an instantaneous moisture content reading, but there is some question of their accuracy when testing wet forage (most are made to test hay). Most electronic-type testers are comprised of a sensing probe and a hand-held display unit. The electrical conductance of the forage is measured between two metal contacts at the tip of the probe when inserted into the forage. Testers determine forage moisture content based on the relationship between moisture content and electrical conductivity.

Heat-type moisture testers tend to be more accurate than electronic moisture testers, although results can be affected by many factors including the effects of hay drying agents. Either type of moisture testers can be purchases from agricultural supply houses, such as NASCO, for around $300.

A relatively new technology is a hand-held device that uses Near-Infra-Red (NIR) scanning technology to measure the moisture content of animal feed. This unit comes with software to collect, view, and store recorded measurements.

Microwave Oven Method

The microwave oven method to calculate forage moisture content allows reasonably accurate results to be obtained in a relatively short time. This method takes about 20 minutes to complete. However, the measured moisture content is much more accurate than when using electronic moisture testers.

Before using the microwave oven method, obtain the following items:

- Microwave oven
- Scale (must weigh in grams)
- Microwave safe plate
- 10- to 12-ounce cup of water
- Pencil and paper

Use the following procedure to obtain the best results:

1. Obtain a representative forage sample (whole plants).
2. Cut the sample into 1-inch pieces; keep leaves and stems uniformly mixed.
3. Place a paper towel on the plate.
4. Weigh a plate plus 100 grams of forage sample; spread the sample as uniformly as possible.
5. Place a 10- to 12-ounce cup of water in the corner of the oven to capture unabsorbed microwaves as the plant tissue dries to prevent potential fire.

6. Set oven on HIGH for 5 minutes.
7. Weigh sample and plate and record.
8. Change the water in the glass.
9. Set oven on HIGH for 2 minutes.
10. Weigh sample and plate and record.
11. Repeat steps 7 through 10 until weight does not change more the 1 gram (this means the sample is dry).
12. Percent moisture = 100 grams – final weight grams.

Make sure to heat samples in short intervals to prevent the forage from igniting.

Kentucky Market Update and Cull Cow Price Seasonality

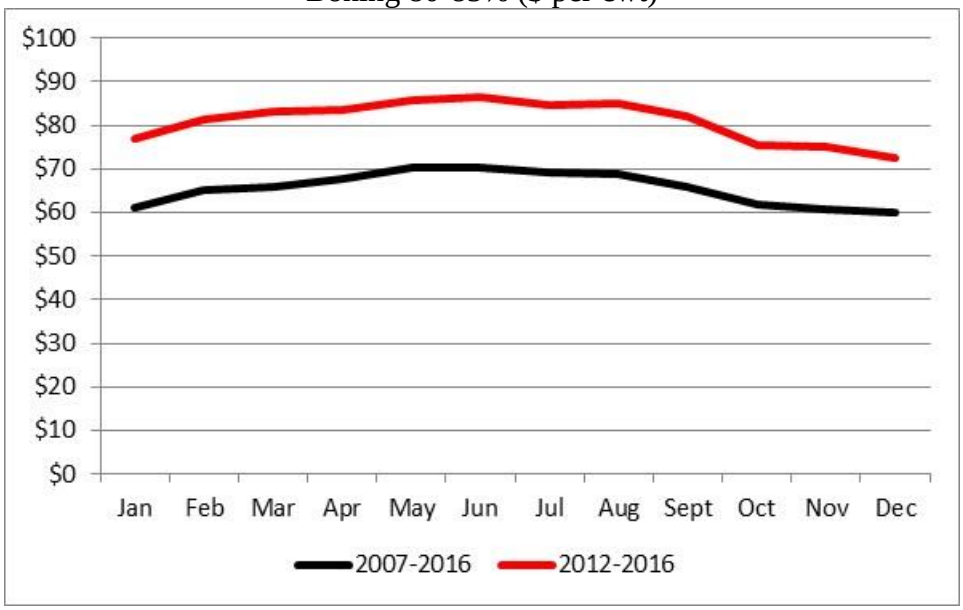
Dr. Kenny Burdine, Livestock Marketing Specialist, University of Kentucky

As is often the case, spring has brought some much needed energy to calf markets. At the time of this writing (April 12, 2017), CME© Feeder Cattle Futures have risen more than $10 per cwt from their early March levels. Rising feeder cattle futures and grass growth have supported calf markets as 550 lb steer calves have moved into the $140's on a state average basis, with several groups breaking into the $150's. This represents roughly a $20 per cwt increase from the lows set in fall of 2016.

This is the time of year when calf markets typically reach their seasonal highs as stocker operations place calves into grazing programs. These same calves tend to reach their lows in the fall as more calves move through markets and their value is primarily determined by what feedlots and winter backgrounders can pay for them. Heavier feeder cattle prices show less seasonal tendencies, but are usually highest in the late summer and early fall. I write about seasonality in calf and feeder cattle markets pretty regularly.

For the most part, I have written much less about the seasonal patterns that exist in cull cow markets. However, since cull cow sales are very significant for cow-calf operations, it makes sense to spend a little time discussing these price patterns. Figure one plots both a 5-year and 10-year average for 80-85% boning cull cows. While the most recent 5 years clearly saw higher cull cow prices, both series show the same general seasonal pattern. Cull cow prices tend to be lowest in the late fall and early winter, then increase into spring and summer. This pattern actually follows the seasonal pattern for weaned calves closely.

Figure 1. Cull Cow Prices at KY Auctions
Boning 80-85% ($ per cwt)

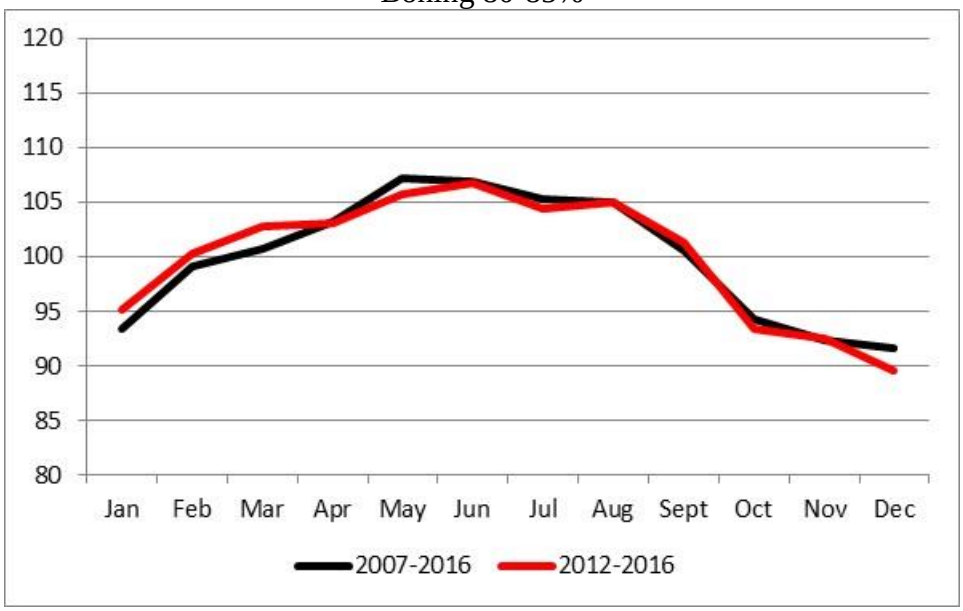


Source: USDA-AMS, Livestock Marketing Information Center

Cull cow prices reach their lows in the fall / winter for a couple of reasons. First, since most operations calve in the spring and wean in the fall, more cull cows are marketed during this time as cull cows tend to be sold when calves are weaned. At the same time, feeding costs are higher during the winter months, which makes cull cows less attractive for another producer to purchase to feed or put back into production at this time. Tracking seasonal patterns has been difficult the last several years given the overall volatility in cattle markets. Many factors outside of seasonality have greatly influenced prices and this has led to exaggerated seasonal, and counter-seasonal, price patterns in many cases. So, taking a long-term view on price seasonality is typically best.

Seasonal price indices are often used as a way to quantify seasonal patterns in prices. Figure 2 plots the same data shown in figure 1, but does so using monthly price indices. A monthly price index is best thought of as a percentage of an annual average. For example, the black line in figure 2 plots monthly price indices from 2007 through 2016. Note that that black line reaches a peak in May at about 107. This means that from 2007-2016, boning 80-85% cull cow prices in May were 7% above the annual average. Similarly, that same series reaches its low in December at around 92. This suggests that from 2007-2016, these same prices in December were 8% below that annual average. (Note that the graph may look somewhat exaggerated since the X-axis does not start at zero. This is done to make the two series easier to distinguish since they are so similar.)

Figure 2. Monthly Cull Cow Price Indices at KY Auctions
Boning 80-85%



Source: USDA-AMS, Livestock Marketing Information Center, Author Calculations

While cull cow seasonality does not get near as much attention as seasonality in other markets, it is worth consideration. Cow-calf operations make culling decisions on an annual basis and revenue from cull cows does impact their cash flow and the amount of depreciation incurred annually on breeding stock. So, like so many other things, cow-calf operators should be aware of seasonal patterns in cull cow prices.