COOPERATIVE EXTENSION SERVICE
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OFF THE HOOF

Kentucky Beef Newsletter October 2017

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

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

Spring-Calving Cows

Spring-calving herds

- Schedule a pregnancy examination of cows if not done previously. Winter feeding costs can be minimized by eliminating open cows prior to winterfeeding.
- Evaluate the body condition of your cows and improve their condition prior to winter.
- If you have already done a preweaning working, revaccinate (booster) calves as needed. Treat calves for internal and external parasites. If you vaccinate calves yourself, be sure to store, handle and administer vaccines properly.
- Wean calves before cows lose body condition.
- Obtain weaning weights of your calves and remember weaning is the time to do your first round of culling and selecting breeding stock. You can eliminate obviously inferior calves, especially those with wild or nervous dispositions. Consider the number of heifers that you will need to save for your cow herd. Bulls that are old, unsound, roguish, etc. can be culled now. It is not too early to begin thinking about replacements now.

Fall-calving herds

- The calving season should be in full swing for fall calvers. Check cows frequently. Identify calves and commercial males should be castrated and implanted.
- Put fall-calving cows on accumulated pasture before the breeding season. This has generally been a good year for moisture. Be sure to save some grass in the breeding pastures.
- It is time to get everything ready for the fall-breeding season, too. Line-up semen, supplies, etc. now and get your bulls ready to go (don't forget their breeding soundness evaluation).
- Obtain yearling measurements (weight, hip height, scrotal circumference, etc.) on replacement animals—especially for registered ones, check pelvic areas, too.

Stockers

- If you are purchasing weaned/stressed calves, have your receiving/feeding program in place. Feed a stress ration which contains at least 13% protein and is fairly energy dense.
- Manage to keep newly weaned and/or purchased calves healthy. Calves should be penned in a small lot with adequate feed, water and shade to reduce stress. Careful handling and comfortable, uncrowded conditions can decrease stress.
- When newly-weaned calves are purchased in the fall, sickness and death loss can be a big problem. Work with your veterinarian on a health and receiving program. Consider purchasing CPH-45 feeder calves which are preweaned, vaccinated, bunk-adjusted and treated for parasites.
- Watch calves closely for a few weeks after their arrival. Have a treatment program ready for any health problems. Early recognition of sick cattle improves their chance of recovery. Watch for drooped ears, hollow appearance, reluctance to rise, stiff gait, coughing and dull or sunken eyes. A good "receiving" program is essential to profitability.

General Reminders

- Avoid prussic acid poisoning which can happen when frosts rupture the plant cells in sorghums, sorghum-sudan hybrids, sudangrass and johnsongrass releasing prussic (hydrocyanic) acid. Fields can be grazed after the plants have dried up after a frost. New growth that occurs in stalk fields is potentially dangerous whether frosted or not.
- Take soil samples for soil analysis to determine pasture fertility needs. Apply phosphate, potash and lime accordingly.
- Test hay quality and make inventory of hay supplies and needs. Make adjustments now - buy feed before you run out in the winter.
- Do not harvest or graze alfalfa now in order for it to replenish root reserves.
- Remove fly-control eartags from all animals, dispose of according to instructions on package. Treat for grubs/lice.

Common Sense and the Cow Herd

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

I tend to oversimplify things – or at least try to break them down to their simplest components. Let's take the cow herd, for example. The cow is the factory that takes raw inputs (like grass) and turns them into a product, - which for most of us is a feeder calf. So the most important thing that she will ever do is to have a live calf. The quality of the calf and how we get there is important too.

Most of the time what is lacking in us as managers is the ability to come up with a good breeding plan and the discipline to stay with it. I remember one producer that would study all of the breed magazines throughout the winter and then pick a different breed of bull every spring. I suggested that he pick a breeding program and stay with it, so that he would have some uniformity in his herd.

When I took over the UK herd at Princeton, it was kind of like that too. So my plan was to breed all of the heifers and young cows to Angus bulls that were selected for maternal traits and save their heifer calves to make replacements as quickly as possible. We bred old cows to a terminal cross (in this case Charolais) to produce heavy feeder calves to sell. Well, when I sold those big feeder heifers and kept the calves from the young cows folks began to say that I had gone crazy and was selling our best calves! But confidence (or stubbornness) wasn't a problem for me and I stayed the course. My goal for the herd was to generate replacement females that we could work with and that were generally representative of the Kentucky cow herd. There are lots of breeding programs that will work but you need to pick a good one and have the discipline to stay with it.

The easiest thing to do is to make cattle bigger. We've known for a long time that a two-breed cross female bred to a third breed bull would give the most heterosis. I did a trial in the 70's in which 2-breed cross calves and 3-breed cross calves weaned 30 and 75 lbs., respectively, heavier than their straightbred contemporaries. We can use smaller maternal breed cows bred to a third breed (terminal) bull and get those big feeder calves. That is all I was doing.

We generally sell feeder calves by the pound – so we can justify big calves. However, big calves generally make big cows. We can easily select for size in any breed. Hence, the 1600 pound cows that now make up the "maternal" breeds. I was at a field day at a purebred producer's farm and the place was a buzz at the exhibit where you could guess the weight of a virgin heifer. They asked me to guess how much she weighed and I said "too much". The correct answer was 1500 lbs. An old rule of thumb is a cow should wean half of her bodyweight. Still not a bad goal.

Cattle breeding and selection is a continual process – it never stops. You are constantly evaluating the cows and calves as they "select" themselves (i.e. produce high quality calves in <u>your</u> environment). Picking a time to cull a cow or calf after you make the decision to cull can be tricky, too.

Cows and bulls that have disposition problems are likely to become a liability and should be sold as soon as possible. However, cows with some structural problems like feet and legs, or udders and teats can wait until it is timely to sell them – as long as you are disciplined enough and keep good enough records to avoid saving their offspring as replacements. It is important that cows be culled while they are still healthy and marketable. Udder problems are especially worrisome – not just because they are heritable but a newborn calf might not be able to nurse. So it may be best to get rid of them before they calve.

I'm not a geneticist but I know that a lot of genes "line up" each time we breed a cow and a bull so there is no assurance that each calf will be a good one. There are times when you need to put the papers down and evaluate a cow on her own merit. Be disciplined enough to cull those that need culling regardless of their sire or blood lines.

In this business it seems that we are constantly looking for "outliers" when perhaps, we should be seeking to moderate traits like frame size. Most cows are big enough – unless they are weaning 800 lb. calves. A.I. allows you to use multiple bulls. I like to evaluate cows for height, muscling, capacity, etc. and breed them to bulls that might improve those traits, which generally means breeding "to the middle" rather than looking for extremes. We seem to be looking for an animal that is as big as a draft horse, milks like a Holstein, marbles like a Wagyu, is muscled like a Belgium Blue and gentle as a lamb. Set some commonsense goals for your cow herd that will enable you to produce quality calves as efficiently as possible. In most commercial cow-calf herds this can best be accomplished through a planned program of crossbreeding. Moderate-size cows which reproduce efficiently in your environment. In my opinion breed complementarity and heterosis are the biggest things that are frequently missing from our commercial breeding programs.

Beef Quality and Care Assurance (BQCA) Program

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

This new program will be a combination of the Beef Quality Assurance program and the Cattle Handling and Care Certification program. This program will consist of an introductory video and a variety of video modules on aspects associated with the proper handling and care of cattle and practices necessary to provide a safe and wholesome product to consumers. Participants will watch approximately one hour of video content and then take an assessment exam on the materials covered. Upon acceptable completion of the assessment exam, you will be certified in Beef Quality and Care Assurance. Recertification will be required every 3 years; however, the content of the videos used can be altered. This program will be available for launch in the counties at the beginning of 2018. If you need additional information, contact Kevin Laurent (kevin.laurent@uky.edu) or Darrh Bullock (dbullock@uky.edu).

Part II: Interpretation of Water Quality Reports and How to Address Common Water Problems

Michelle Arnold, DVM (Ruminant Extension Veterinarian, UKVDL), University of Kentucky

Many producers rely on wells and surface waters such as ponds and creeks to provide water for livestock, but these sources can be contaminated by many pollutants within the watershed. Part I of this two-part series (September 2017 edition of Cow Country News) addressed excess sulfur and nitrates in drinking water, blue green algae in ponds and certain microorganisms (bacteria, viruses and protozoans) in water that are the most common water-associated problems in KY causing serious clinical disease in cattle. Part II will focus on water quality test interpretation and problem solving.

Testing water quality for livestock consumption is often suggested but can be expensive and the results may prove challenging to interpret. Not all laboratories run the same battery of tests, reference ranges may be expressed in unfamiliar units, and the test names may not make sense from a livestock producer's point of view (for example, how does "Electrical Conductivity" affect water safety?). Other important tests for bacteria (coliforms), pesticides, and blue-green algae that can directly affect cattle health usually are not part of a routine water screen. Adding to the problem of water analysis is the fact that water is dynamic. What is sampled today from a creek, pond or well may be completely different from yesterday and may not be the same next week. Similarly, where the sample is taken may not be representative of all available water sources for livestock on a farm. Rate of exposure influences potency; a big drink of water with high levels of nitrate is much more dangerous than nitrate consumed from forage spread over an entire day's grazing. Short term exposure to pollutants (days-weeks) may have different effects than long term exposure (months). Given these known challenges, when does it make sense to invest the time and money to test water? If tested, will the results change the way cattle are offered water or will the water need to be purified before it is used?

Testing water quality makes sense in a number of situations. If multiple animals are sick or dead and the water source is common to most if not all of the cases such as with a blue-green algae bloom in a pond, testing water is certainly appropriate. But what about less obvious issues of poor performance (slow weight gain in calves, many cows found open after breeding season) and increased health problems noted in a herd? Growth, reproduction, milk production, and immunity are all related to access to clean water. If there are herd health or performance concerns, digestive upsets (diarrhea) with no known cause, or unusual smells or colors to water, a water analysis may help answer why. Depending on the tests selected, the laboratory will specify how the sample should be collected, the type of container to use, what forms to complete, and how to pack and ship the sample. Typically water samples should be taken in clean plastic or glass jars of at least 1 liter in volume and sealed with a plastic cap (non-metal). Samples should be delivered as quickly as possible to the laboratory and usually need to be chilled if shipping.

Interpretation of water quality reports and how the results relate to problems observed can be challenging at the very least. Generally, a routine water quality test for livestock suitability includes pH, a measure of salinity, hardness, nitrate, sulfate, and iron and manganese levels. Of these, salinity is one of the first results to critically evaluate. "Salinity" is a measure of the saltiness or the dissolved/ suspended particles in a solution. Salinity may be indirectly measured and reported out as total dissolved solids (TDS), total soluble salts (TSS) or electrical conductivity (EC). TDS refers to all substances in water that can pass through a tiny (2 micrometer) filter. TDS is approximated by the electrical conductivity (EC) of water. Because it is assumed most dissolved solids in water are salts, a measure of total soluble salts (TSS) that includes sodium chloride (NaCl), bicarbonate, sulfate, calcium, magnesium and silica salts is frequently used for initial assessment. Values above 1000 ppm for either TDS or TSS should definitely "raise the red flag" to further investigate the water components beyond the basic livestock suitability screen. These measures of salinity do not specify what is actually in the water but high TDS or TSS often means poor tasting water leading to reduced intake. Additional elements in a water analysis may include calcium, magnesium, phosphorus, potassium, copper, zinc, sodium, and chloride. Table 1 lists some of the metals and anions commonly reported on water quality reports. Certain

labs will report total coliform counts and fecal coliforms as measures of bacterial contamination. Be aware that an organic compound screen usually must be requested separately to look for potential toxic chemicals such as pesticides and hydrocarbons. Table 2 lists available water quality tests at the UKVDL.

Concentrations where water pollutants begin to cause livestock health problems vary between studies but, in spite of this limitation, excellent reference charts have been developed as guides to water quality interpretation. For a complete review of water quality, see UK Extension factsheet ID-170 "Drinking Water Quality Guidelines for Cattle" at http://www2.ca.uky.edu/agcomm/pubs/id/id170/id170.pdf .

Once the analysis is complete, decisions can be made on how problems may be addressed. Possible water treatments include disinfection, water softening, reverse osmosis, distillation, ion exchange and filtration depending on the problems identified. Chlorine (bleach) remains an inexpensive yet effective disinfectant. See https://ohioline.osu.edu/factsheet/ANR-12 for guidelines on algae control in water tanks. Distillation, reverse osmosis and ion exchange will reduce sulfates, nitrates and minerals in water but these purification processes can be costly to install and maintain. Although municipal or "city" water can be expensive to install, it is the most reliable source of consistently clean water.

There are many possible contaminants in source waters and their potential interactions with livestock production are complex. Some constituents are directly toxic to livestock at certain levels, others may change the availability of key nutrients or act synergistically with other potentially toxic metals. Some constituents may contribute to water system fouling and/or palatability issues that indirectly impact livestock production. Decreased consumption due to bad taste is potentially just as bad as water deprivation. Surface and ground water, especially livestock ponds, can be contaminated with microorganisms, chemicals, excessive minerals and a host of other compounds that keep cattle from reaching optimum production. Testing water sources is the only way to know if they are acceptable for livestock use.

Table 1: Anions and Metals in Water

Water Test Result:	**Comments**	**Sources of Contamination**	**Recommendations for Cattle**
pH	Low pH (<6) causes corrosiveness and gives water a metallic taste. High pH gives the water a slippery feel, soda taste, and leaves deposits. High alkaline water may have a flat, unpleasant taste.		6.0 to 8.5 is ideal; may range from 5.5-9.0
Salinity, TDS or EC, TSS	Mostly from NaCl; bicarbonate, sulfate, calcium, magnesium, and silica may also contribute. May add color to the water. Reduces water intake (salty taste)	Sum of all inorganic contaminants in water	< 1000 ppm safe. Further testing recommended for all major water minerals, salts and metals if above 1000 ppm
Hardness	Sum of Calcium (Ca) and Magnesium (Mg); reported as equivalent amount of CaCO3; Hard water leaves scaly deposits on plumbing and fixtures, decreases the cleaning action of soaps and detergents and may clog	Naturally dissolved Ca and Mg from soil and limestone.	0-60 ppm is soft, 61-120 is moderate, 121-180 is hard, and>180 ppm is very hard. Generally no adverse effects but very high Ca or Mg levels may need to be considered

	pipes over time. Hard water may be more palatable than soft water.		in ration formulas
Nitrate (NO3)	Higher levels may result in poor performance, fertility problems, and increased infections. Excessively high levels can cause rapid death and, if cow survives, can cause abortion	Runoff from fertilizer use; leaching from septic tanks; sewage; erosion of natural deposits. Ponds with runoff from heavily fertilized or manure-covered fields and water from poorly cased, shallow wells may contain nitrates. *Nitrates should be evaluated in both feed and water for a measure of total intake*	0-100 ppm Nitrate is safe with low nitrate feeds and balanced diet. Nitrate can be reported as nitrate (NO3), nitrate-nitrogen (NO3-N), or potassium nitrate (KNO3). These numbers are NOT equivalent, as they represent different chemical structures. Make sure the water reference range used for a particular result match the type of analysis performed.
Sulfate (SO4)	High sulfur can cause acute death, polioencephalomalacia, trace mineral deficiencies (especially copper) and reduction of growth and performance.	Sulfur spring water. The most common form of sulfur in water is sulfate (SO4). *All dietary sources of sulfur (water, forage, concentrates) contribute to total sulfur intake and potential toxicity*	0-500 ppm is safe but >200 ppm may cause odors, bitter taste, and have a temporary laxative effect. Will negatively affect selenium and copper absorption. Concentrations above 1800ppm may result in acute death
Copper (Cu)	May also add color to the water. Short-term exposure causes GI distress; long-term exposure causes liver and/or kidney failure.	Corrosion of household plumbing systems; erosion of natural deposits. May see blue-green staining of plumbing with high copper water. May be elevated levels from treatment of ponds with copper sulfate algaecides	< 0.5 ppm. Above 1.0 ppm gives metallic taste to water and reduces intake
Iron (Fe)	> 0.3 ppm supports growth of iron bacteria (foul smell), and gives metallic taste to water that reduces water intake. May add a rusty color to the water and cause reddish to orange staining of plumbing and fixtures. May	Iron leaches out of high iron rocks into the aquifer. Deep wells with low dissolved oxygen content and/or high carbonate content will have higher dissolved iron content.	< 0.4 ppm is acceptable. Taste problems are the main issue with high iron water. Chlorination can kill iron bacteria and reduce the foul smell and orange film

	tie up zinc, potentially other microminerals	Iron may also come from pipes carrying corrosive water.	formation from high iron waters. Water softeners can reduce iron if it is 3 to 10 ppm in the natural water but chlorination and filtration work better with very high Fe.
Manganese (Mn)	Gives water a bitter, metal taste and bad odor if >.05 ppm. Turns water black or brown and causes black staining of plumbing and fixtures. Mn bacteria may clog pipes with black "sludge." Ties up zinc.	Deep wells with low dissolved oxygen content; also wells with high carbonate content.	< 0.05 ppm is acceptable. Chlorination and filtration will reduce very high Mn.
Molybdenum (Mo)	Molybdenum (Mo) ties up copper, causing a secondary copper deficiency. Off feed, weight loss, diarrhea, anemia, loss of hair coat color and bone/joint deformities may occur with long term exposure to high Mo levels. Decreased reproductive function is often observed	Industrial contamination by metal alloy manufacturing, copper mining and coal mining. Concentrations in water are typically low unless contaminated by an outside source.	< 0.3 ppm is acceptable. More importantly, the Cu:Mo ratio should be at least 2:1 and 4:1 is preferred. Less than 2:1 results in decreased production, especially if dietary Sulfur is also high.
Chloride (Cl)	Important anion - contributes to acidosis. Reduces water intake due to bad odor or taste (salty taste) if > 250 ppm. May also increase corrosiveness of the water	Occurs naturally from deep brines or activities such as gas and oil well drilling or road de-icing.	<250 ppm

Table 2: Water Testing Offered by the UKVDL

Test Name	**Specimen, Optimal Amount** **Bold = preferred (Min. Amount)**	**Shipping Conditions**	**Turn Around Time/Schedule**	**Test Comments**
Anions in water	**50 ml water (10 ml)**	Sealed container. Chilled.	2-5 business days /	Panel includes bromide, chloride, fluoride, nitrate, nitrite, phosphate, and sulfate
Metal panel - Feed, water, environmental samples	50 g feed (2 g) 100 ml water (20 ml) 50 g source material (2 g)	Non-metal container. Keep moist samples frozen or chilled.	3-5 business days /	Panel includes: arsenic, cadmium, chromium, cobalt, copper, iron, lead, magnesium, manganese, molybdenum, phosphorus, potassium, selenium, sodium, and zinc Note: Mercury is not routinely

				included in this panel unless specifically requested. Please note on accession form if mercury analysis is needed.
Nitrate/nitrite- ocular fluid, serum, water	2 mL serum (1 ml) 100 mL water (1 ml) Whole eye or 2 ml ocular fluid (1 ml)	Sealed container. Frozen or chilled.	1-3 days; STAT same-day analysis available Mon-Fri upon request /	Includes Nitrate/Nitrite Separate serum before shipping
Selenium – tissues, feed, water, other	10 g liver (1 g) 50 g GI contents (5 g) 50 g feed (5 g) 100 mL water (20 mL) 50 mg liver biopsy (30 mg)	Non-metal container. Frozen or chilled.	3-5 business days /	Also see Metal Panel and Metal Panel-Trace Minerals. See Metal Panel-Trace Minerals for liver biopsy information.
Sulfate – water	50 mL water (2 mL)	Sealed container. Chilled.	1-3 business days /	

Kentucky Beef Cattle Market Update

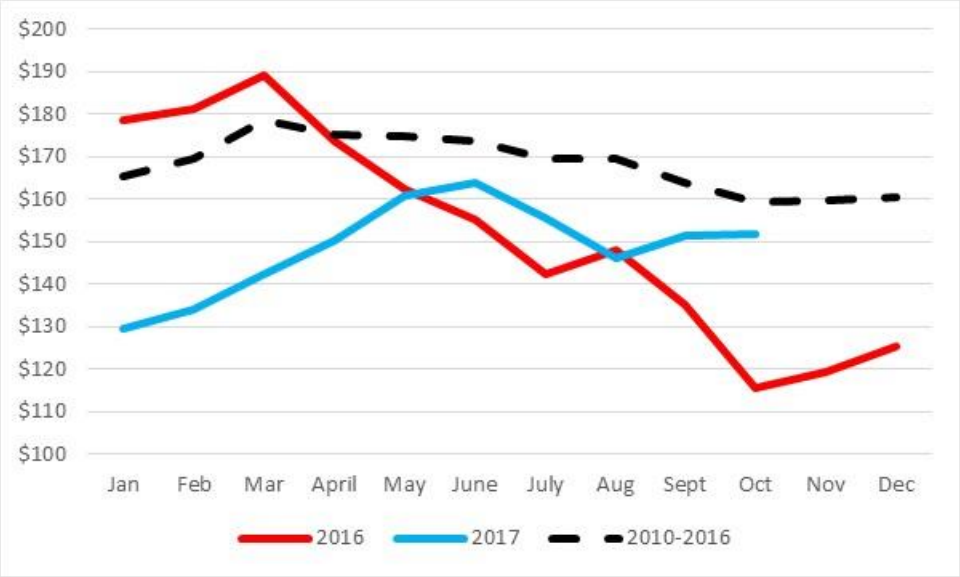
Dr. Kenny Burdine, Livestock Marketing Specialist, University of Kentucky

The feeder cattle market continues to hold reasonably well as we move further into fall. As I write this on October 18, 2017, fall CME© Feeder Cattle futures contracts are trading in the low $150's with spring contracts in the mid-$140's. The fed cattle market did seem to find a bottom in early September and has moved upward from there. This was welcome news across the entire complex. Corn prices have been pretty steady since last month. USDA raised their corn yield forecast slightly in October and the current is for nearly a 14.3 billion bushel crop.

Locally, calf prices are not showing their usual seasonal decline. Fed cattle and corn prices are part of the reason for this, but I also think the good fall weather is at play. October is a typical weaning time for most spring calving operations. However, most producers have had excellent fall moisture and pastures are growing exceptionally well right now. This has likely delayed the fall calf run as many have likely chosen to wean later or may be keeping calves post-weaning to take advantage of inexpensive gain on grass. Also note that I usually don't include the current month in the charts below, but since I had two full weeks of prices, I chose to include October this time. When I show those charts next month, October will include the whole month, so expect it to change somewhat.

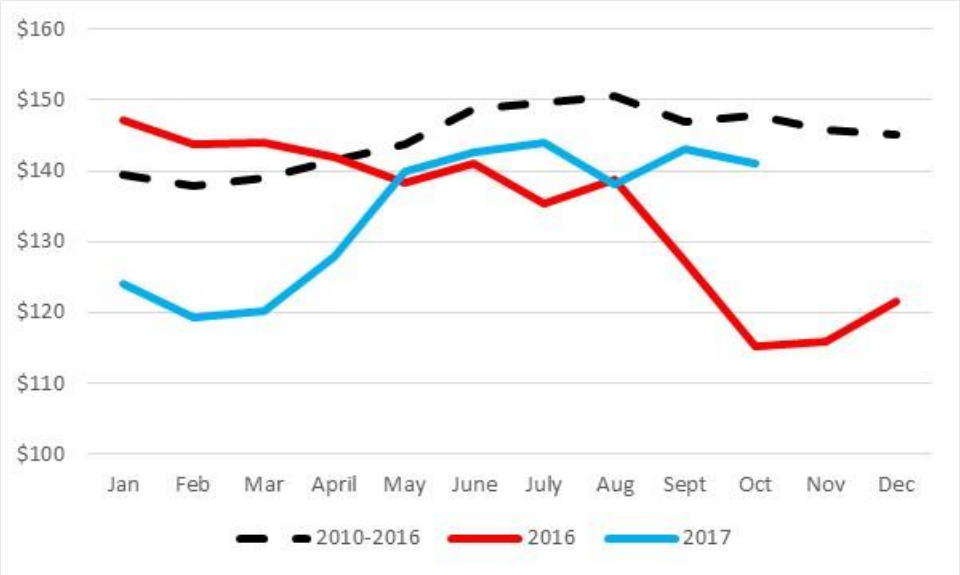
I would still expect calf prices to decline somewhat once we start seeing larger numbers of calves move through the system. Also remember that stockpiled pasture, for which this has been an excellent year, also supports calf prices by lowering backgrounding costs early in the program. Pretty soon, feed costs will be driving those calf values. The good news is that feed costs are lower and the spring feeder cattle board is much stronger than it was this time last year. So, my best guess for this fall would be for calf prices to bottom in November or early December, but remain significantly above where they were last fall.

Figure 1. 550# Medium & Large frame #1-2 Steers
KY Auction Prices ($ per cwt)



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

Figure 2. 850# Medium & Large Frame #1-2 Steers
Kentucky Auction Prices ($ per cwt)



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