CATTLEMAN'S CORNER

*Division of Agriculture Sciences and Natural Resources * Oklahoma State University* **JULY/AUG 2016**

Many factors affecting beef market prices and volatility

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A wide variety of internal and external factors are impacting beef and cattle price levels and volatility. Beef production is at a seasonal peak in June with weekly beef production since late May estimated to be nearly 7 percent above year ago levels. Fed cattle prices have dropped and could be near an early seasonal low with feedlots ahead of schedule for summer marketings. Year over year cattle slaughter is up while cattle carcass weights are lower compared to last year, moderating beef production increases somewhat. With Independence Day meat already booked, wholesale beef values have dropped sharply the past ten days to support sales of seasonally large beef supplies. If the three-day July 4 weekend results in strong retail beef movement, beef markets may maintain good momentum through the summer doldrums between July 4 and Labor Day meat sales in August. The latest retail beef prices indicate that beef prices are declining quite slowly; in fact, the all fresh beef price for May was up slightly from April. Overall indications are that beef demand is holding strong in the face of growing beef supplies. Beef movement this spring has been good; indicated in part by the drawdown of large beef cold storage supplies to levels six percent below year earlier levels in the latest report.

The June Cattle on Feed report was very close to expectations and should not provoke much market reaction. The report did confirm strong marketings that suggest that feedlots continue to be very current, as evidenced by declining carcass weights. The report also confirmed continued year over year increases in feedlot placements meaning that feedlot production will be cyclically higher late in the year. The increased placements were all in the heavy weight categories and will be marketed out of feedlots in the fourth quarter of the year. June 1 feedlot inventories were 102 percent of year ago levels. Despite larger feedlot inventories and big feedlot placements, feedlots are in significantly better shape now compared to this time last year and well positioned to handle the challenges of increased feedlot production in the coming months as long as marketings continue at a good pace

Last week's Brexit vote, with the United Kingdom opting in a close vote to exit the European Union, sent shock waves through global markets and especially for currency exchange markets. The U.S. dollar strengthened, not only against the British pound, but also against most other currencies. The Japanese yen also strengthened sharply as global markets turned to the safe havens of the dollar and the yen. It is likely that a good deal of the uncertainty surrounding the UK departure from the European Union will subside but the timetable is unknown and some impacts will persist for extended periods or permanently. Meantime, U.S. beef and other meat markets are hampered by the additional headwinds of a stronger dollar slowing exports and supporting imports.

Soybeans led a crop price rally over the last month, mostly on crop concerns out of South America. Corn followed suit supported by ample fund buying which all crashed down last week on the reality that the U.S. corn crop is large and in very good shape at this point in the year. Higher average soybean prices are expected in the coming crop year, with U.S. corn prices close to year earlier levels. This week's crop acreage report could show some shift of corn acres to soybeans although total planted acreage could be bigger with less prevented plant acres expected compared to last year. Corn, soybean and wheat acreage could all shift somewhat with this next report. Major impacts on crop markets and prices are not expected but the uncertainty is there. In general, beef market fundamentals are quite strong but broad-based market volatility will continue to be a challenge for producers.

Monitor mineral intake closely during summer

Glenn Selk, Oklahoma State University Emeritus Extension Animal Scientist

Summer often becomes a busy time of year for ranchers (especially during haying season). Don't forget to check the mineral feeders or blocks to be certain that they are supplying the minerals that your cows need. In some cases, medications may be recommended by your veterinarian to be included in the mineral mix. Cow calf operators will want to monitor mineral consumption closely to be certain that the label-recommended amounts are being consumed by the cattle. In the near future, a "Veterinary Feed Directive" (VFD) will be necessary for most antibiotic feeding in mineral supplements. Contact and work with your local large animal veterinarian about the appropriate VFD for your operation. For more information about the Veterinary Feed Directive refer to this brochure from Oklahoma State University Extension.

Placement of mineral feeders and blocks can aid in achieving optimum mineral intake. Place them in areas where cattle spend a lot of time. Minerals should be placed in loafing areas, near water sources, in shady areas, or any other location that tends be a popular place for the herd to congregate. A rule of thumb is to provide one mineral feeding station for every 30 to 50 cows. Check feeders at least once a week and keep a clean, fresh supply of minerals present at all times. A good feeder should keep minerals dry, be portable and hold up to abuse and corrosion. Open tubs are not adequate in high rainfall areas.

Choosing a mineral mix requires understanding of the animal's requirements and the minerals available in the forages and feedstuffs available to the animals. Mineral needs tend to be area specific and change with soil type, fertilization rates, rainfall and many other factors. Mineral requirements also will depend on animal age and stage of production. An excellent reference source for Oklahoma beef producers about mineral supplementation can be found in the Oklahoma State University Extension Bulletin E-861 "Vitamin and Mineral Nutrition of Grazing Cattle."

Feeder cattle markets: crossroads of the cattle industry

Derrell S. Peel, Oklahoma State University Extension Livestock Marketing Specialist

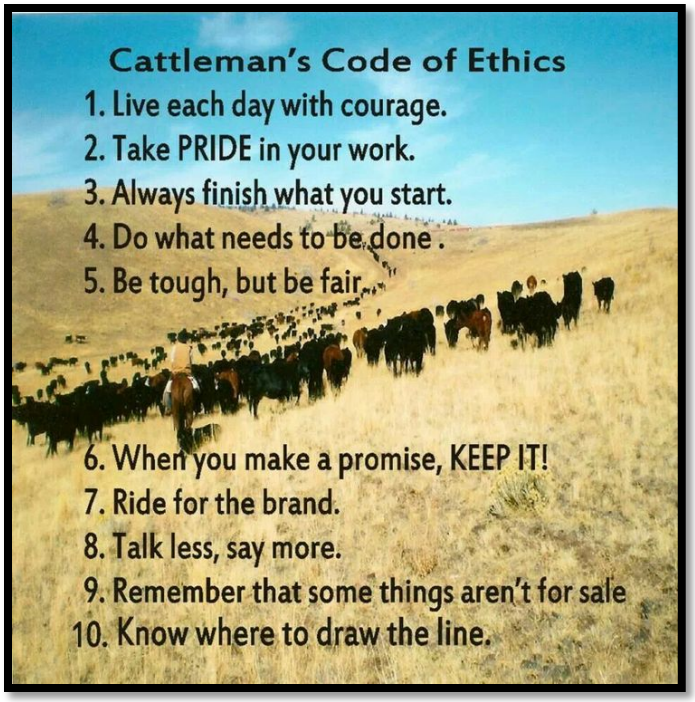
The job of markets –any market– is to determine what will be produced; how much will be produced; and what resources will be used to produce; all relative to the demand for the product. The cattle industry produces fed cattle ready for slaughter. However this production mostly occurs across separate and widely dispersed sectors of cow-calf, stocker and feedlot production by producers who only interact through market transactions.

Feeder cattle markets are the one and only place in the cattle industry where cow-calf, stocker and feedlot producers all communicate, albeit indirectly through feeder cattle prices, as cow-calf producers sell calves, stocker producers buy stockers and sell feeders and feedlots buy feeder cattle. In order to coordinate cattle markets, feeder cattle prices must simultaneously encourage cow-calf production to ensure available cattle supplies for the industry while reflecting beef demand back from consumers through fed and feeder cattle prices. In between, feeder cattle prices determine whether cattle will be produced using relatively more or less forage versus grain in the stocker and feedlot sectors. Feeder markets must reflect production conditions at the cow-calf level which, along with stocker production, depend heavily on forage conditions; and at the same time capture feed market conditions that affect feedlot production; all the while transmitting consumer demand from retail and wholesale beef markets all the way back down to the cow-calf sector. It is an enormous challenge to coordinate such a complex industry. This coordination uses not one but a constellation of feeder cattle prices across weights ranging from lightweight calves to heavy feeder cattle. The coordination is not only the result of price levels but the relationship between feeder prices across the weight range.

In general, cow-calf producers, with a high proportion of costs that are fixed at least in the short run, respond to calf price level. Calf prices are either high enough or not to encourage more or less calf production. However since cow-calf producers use a relatively fixed forage base that often has no other use than for cattle production, changes in cow-calf production simultaneously imply retained ownership decisions as cow-calf producers consider the best way to market the forage they produce: through more weaned calves or fewer heavier, retained calves. At the other end of cattle production, feedlots are trying to assess the margins for finishing cattle – driven by heavyweight feeder prices relative to fed cattle

prices – along with feed costs to determine whether they should be adding more or less weight to cattle using grain, in other words, do they want to buy more or less initial pounds of cattle to place and run fewer animals through the feedlot over more days or move heavier animals through the feedlot more quickly. In the short run, feedlot cost of gain is a major driver of feedlot decisions about what size and how many feeder animals to buy. These feedlot decisions simultaneously provide market signals for stocker producers to assess the potential for adding additional weight to feeder animals prior to entering the feedlot. This potential is reflected in the relationship between prices of lightweight and heavyweight feeder cattle. This relationship, often referred as the "rollback" or price slide across weights, determines the value of gain for stocker production.

Feeder prices simultaneously impact cow-calf, stocker and feedlot production and price adjustments usually reflect impacts and market balance across all sectors. However, occasionally unusual circumstances result in market signals for one sector dominating the others. This helps to understand feeder cattle markets since 2013. The sharp post-drought decrease in beef production in 2014 and 2015 prompted dramatic calf price signals to jumpstart cow herd expansion. Hence the unprecedented increase in feeder cattle prices from mid-2013 into 2015. However, this occurred at the expense of feedlots where high feeder prices resulted in the worst feedlot losses ever in 2015. With herd expansion underway, the dramatic drop in feeder prices in late 2015 realigned feeder to fed prices and a return to more typical margins for feedlots. The result was an increase in feeder prices faster and higher than anyone anticipated in 2013 and 2014 followed by a sharper and quicker drop in prices in 2015 than anyone expected. Nothing this extreme has ever been seen in the cattle industry so no one really understood what was happening except with the benefit of hindsight.



Cattle production is ultimately one production process that is completed in different sectors with different producers in many different places and using different resources. Anything that impacts any of the sectors must ultimately be transmitted and coordinated across all sectors. It is basic supply and demand but so much more complicated than just a question of how much should be produced. Because cattle, as ruminants, are so flexible in production, the question of how to produce cattle, i.e. what resources to use for production is very complex and dynamic as feed markets change. Much of the challenge of coordinating this complex set of production decisions occurs in the set of feeder cattle markets through changing price levels and rather subtle changes in price relationships across weights of feeder cattle.

Comparing Prussic Acid and Nitrate Toxicity in Cattle Operations

Glenn Selk, Oklahoma State University Emeritus Extension Animal Scientist

As we head toward the "dog days of summer", heat and drought may cause plants intended for hay or grazing to be stressed. Summer annuals most often include the forage sorghums and when stressed they are capable of accumulating toxic levels of nitrates or "prussic acid".

Some confusion exists among cattle producers about the two major toxins that are deadly or costly because of production loss to cattle owners. Both prussic acid and nitrates become health concerns during heat and drought stress on hay or pasture crops. Below is a comparative list of the major differences that producers need to keep in mind about these two problems. Prussic acid and nitrates are capable of happening together or separately in any given drought-stressed situation.

Prussic Acid	Nitrate Toxicity
Caused by hydrocyanic acid	Caused by excess nitrate that leads to excess nitrite in rumen
Primarily in leaves	Primarily in stems
Kills very quickly	Kills in a few hours
Blood is bright cherry red	Blood is chocolate brown
Rarely, if ever, found in pearl millets	Often higher in stressed pearl millets
Most dissipates when hay is cut and completely cured	Stays in hay indefinitely
Most occurs in grazing cattle	Occurs in both grazing and hay feeding
Drought stress OR re-growth after frost	Drought stress and/or high fertility
Field testing may be available	Screen test available through OCES*
Accurate quantitative test requires fresh, moist sample	Quantitative testing can be done on fresh or dry forage
Laboratory test at OADDL+ (call ahead, sample must be properly handled)	Quantitative laboratory test through OCES* offices and OSU Soil, Water and Forage Testing Laboratory
More info at OSU Fact Sheet PSS-2904	More info at OSU Fact Sheet PSS-2903

Treatment of sick animals for either toxin must be done immediately by veterinarian!

*Oklahoma Cooperative Extension County Offices
+Oklahoma Animal Disease Diagnostic Laboratory Stillwater, Oklahoma.

The "positive associative effect" of high protein supplements

Glenn Selk, Oklahoma State University Emeritus Extension Animal Scientist

Most of Oklahoma has substantial standing forage in pastures as we go into late summer. As the day length shortens, plants become more mature and lower in protein content. However, the protein requirements for growth, milk production, and body condition maintenance of beef cattle do not decrease as the "dog days of summer" arrive.

The micro-organisms in the rumen of beef cows and replacement heifers require readily available protein to multiply and exist in large enough quantities to digest the cellulose in low quality roughages. Protein supplementation of low-quality, low protein forages results in a "***positive associative effect***". This "positive associative effect" occurs as supplemental protein available to the "bugs" in the rumen allows them to grow, multiply, and digest the forage more completely and more rapidly. Therefore the cow gets more out of the forage she consumes, she digests it more quickly and is ready to eat more forage in a shorter period of time. Data from Oklahoma State University illustrates this (Table 1). The prairie hay used in this study was less than 5% crude protein. When the ration was supplemented with 1.75 lbs of cottonseed meal per day, retention time of the forage was reduced 32% which resulted in an increase in feed intake of 27%. Because hay intake was increased, the animal has a better chance of meeting both the protein and energy requirement without supplementing other feeds. Because retention time was decreased, one could postulate the protein supplementation in this situation also increased digestibility of the forage.

Table 1. Effect of Cottonseed Meal Supplementation on Ruminal Retention Time and Intake of Low-Quality Prairie Hay

	Daily Supplement of Cottonseed Meal		
	None	**1.75 lb**	**Change**
Rumen Retention Time, Hr	74.9	56.5	-32%
Voluntary Daily Hay Intake, % of body wt.	1.69	2.15	+27%

As producers prepare their late summer, fall, and winter feed strategies, they can see the importance of providing enough protein in the diet of the cows to feed the "bugs" in the rumen. If the forage is low in protein (less than 8 % crude protein), a small amount of supplemental protein such as cottonseed meal, soybean meal, or one of the higher protein by-product feeds, could increase the amount and digestibility of the forage being fed. This strategy requires that ample forage is available to take advantage of the "positive associative effect". As the table above illustrates, properly supplemented cows or replacement heifers will voluntarily consume about 27% more forage if they were provided adequate protein. As long as enough forage is available, this is a positive effect of a small amount of protein supplement.

Time of day of harvest and impact on nitrate concentration

Glenn Selk, Oklahoma State University Emeritus Extension Animal Scientist

Forage sorghums are used by cattle producers for summer grazing or harvested for hay. Forage sorghums can be very productive and high quality, but can also accumulate toxic levels of nitrate when stressed. Based on the assumption that the plant continues soil nitrate uptake during nighttime hours, followed by accelerated conversion of the nitrate to protein during daylight hours, previous extension recommendations have been to wait until afternoon to cut forage sorghum for hay if anticipated nitrate levels are marginally high.

To evaluate the significance of the change in nitrate concentration in forage sorghums during the day, Oklahoma State University Extension Educators collected samples at two hour intervals from 8 AM to 6 PM. Five cooperator's fields ("farm") were divided into quadrants. Three random samples, consisting of ten stems each, were taken from each quadrant at the specified interval. The samples were analyzed at the Oklahoma State University Soil, Water, and Forage Analytical Laboratory to determine the level of nitrates, in parts per million (ppm).

As expected, differences between "farms" were substantial and significant. The mean concentration of nitrate for individual farms varied from only 412 ppm to 8935 ppm. The mean nitrate concentrations across all farms were 3857, 3768, 4962, 4140, 4560, and 4077 ppm for samples at 8 AM, 10 AM, noon, 2 PM, 4 PM, and 6 PM, respectively. Remember, most laboratories consider nitrate concentrations at, or above 10,000 ppm potentially lethal. **There was much more variation between farms than between harvest times. Time of day of harvest did NOT impact nitrate concentration or proportion of dangerous samples of forage sorghum hay.** Don't be led into a false sense of security by thinking that forages cut in the afternoon or evening are safer. Source: Levalley and co-workers. 2008 OSU Animal Science Research Report.

Managing beef cow margins: grazing cost

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Cow-calf revenues have decreased dramatically in the past few months and are expected to remain lower for the next couple of years. Producers must focus more attention on cost management to help maintain net returns in this environment. A reasonable question to ask is: don't producers always attempt to minimize costs in order to maximize profits? The answer is generally yes but the fact is that there are ways to manage costs that require more effort and intensive management and may not be routinely employed or may not have been previously used by a producer.

Information from Kansas State University (http://www.agmanager.info/livestock/budgets/production/beef/FeedCosts_2015.pdf) indicates that total pasture plus non-pasture feed costs represent 45-50 percent of total annual cow costs. Non-pasture cost includes both harvested forages and supplemental feeds. Total feed cost is the single largest component of annual cow costs and arguably the best opportunity for cost management. The breakdown between pasture and non-pasture costs is particularly useful because it focuses on the forage, which is the primary production of cow-calf and stocker operations, and the management of that grazing resource compared to the use of harvested forages and supplemental feed to augment the quantity and quality of grazed forages. Often tradeoffs are possible in the efficient use of grazed forage compared to the use of more expensive harvested forages and purchased supplemental feeds. Of course, all of this takes place against the backdrop of herd nutritional management as an important component of herd health, reproductive efficiency and overall productivity. Both feed quantity and quality are critically important in herd nutritional management.

In order to evaluate and make good decisions about feed management and the tradeoffs between grazing and non-pasture feed costs, it is critical to know the cost of grazed forage. Published pasture rental values in Oklahoma provide a means to understand the cost of grazed forage. A wide variety of pasture types are used in Oklahoma including native range as well as introduced warm season forages such as Bermuda or old world bluestem and cool-season grasses such as fescue and ryegrass. When differences in rental rates, stocking rates and grazing season length are accounted for, the cost of grazed forage is very consistent across forage types at about 1.5 cents per pound of grazed forage. Thus, grazed forage costs about $30/ton. For a cow eating 30 pounds of forage per day, this is $0.45/head/day. The grazing season reported for pasture rental is roughly 270 days for warm season grasses; less for cool-season forages. However, combinations of warm and cool season forages, and delayed grazing on stockpiled pastures can extend the grazing season by 30 - 60 days. Again, the key is increased management in the form of planning pasture use, deferment and fertility (for introduced grasses). Forage alternatives, such as grazing small grain (e.g. wheat) pasture, winter annuals (radishes, turnips, et.) and including more legumes in introduced pastures may significantly impact seasonal forage quantity and quality and should be evaluated to determine feasibility in specific situations.

Understanding pasture value also highlights decisions about pasture management. In situations where invasive species, such as eastern red cedar, have a direct impact on available forage, the value of control, or alternatively, the cost of not controlling the loss of grazing to these pests becomes much clearer. When hay is used to replace grazing, the cost is always higher. A future article will look at hay costs in more detail.

Fetal programming and calf health

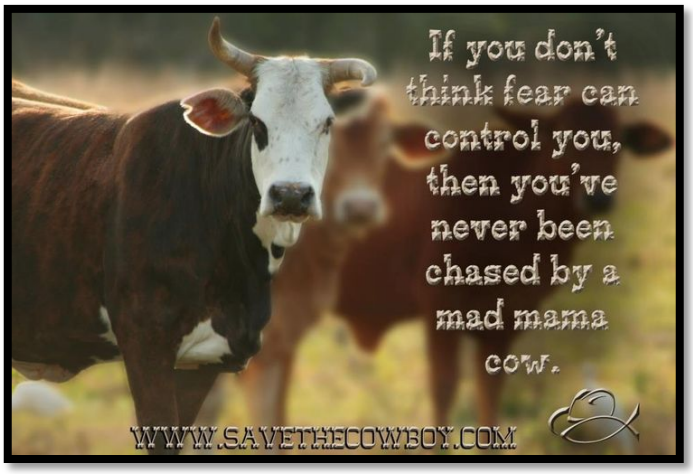
Glenn Selk, Oklahoma State University Emeritus Extension Animal Scientist

A relatively new arena of beef cattle research is labeled “fetal programming”. Fetal programming is generally considered the impact of nutritional and health status of the mother during pregnancy and its impact on the health and productivity of the offspring. Much of the research on maternal nutrition during pregnancy has focused on the last trimester when most fetal growth takes place. The relationship between late pregnancy nutrition and health of the calf is confounded by the colostrum production and intake. Undernourished cows in late gestation produce less colostrum and therefore calves with increased sickness and death loss.

However, little is known about the effect of nutrition on the middle third of gestation and subsequent health of the calf. The immune system of the fetal calf is developing at this time. Will an undernourished beef cow adversely affect the ability of her calf to ward off diseases after birth and into the feedlot phase of production? South Dakota State University scientists looked at the effects of cow energy status during mid-gestation on progeny performance including immune function. They used 151 cows fed to maintain a body condition score of 5.0 to 5.5 (positive energy status treatment) or fed cows to only 80% of what they needed to maintain body weight and condition (negative energy status treatment). These treatments were applied during the middle three months of gestation. During the first one-third of gestation and the last third of gestation all cows were fed similar diets.

After weaning, the calves were taken to a feedlot where growth and production traits could be monitored. A subsample of the calves was subjected to a foreign protein (ovalbumin) challenge 19 days after arrival at the feedlot. They then measured the antibody response to the ovalbumin challenge to determine immune activity by the calves. These scientists

found no differences in birth weight, weaning weight, feedlot average daily gain, dry matter intake, or gain to feed ratio due to the nutrition of the cows in mid-gestation. However, the calves born to the positive energy status cows had significantly greater antibody titers when challenged than did the counter parts that were born to the cows with restricted energy in mid-gestation. They concluded that mid-gestation nutrition may very well have an effect on immune response of calves during a receiving period in the feedlot. Source: Taylor, et al. 2016: Professional Animal Scientist. Vol. 32:4: pp.389-399.



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