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Ask for a Feed Analysis Report on Hay Before Buying or Feeding

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Winter is coming. Drought, deteriorating pasture conditions and short hay inventories in Oklahoma and the surrounding states of Texas, Missouri and Kansas, has most cow-calf operations scrambling to secure hay supplies for the coming winter. Given the current situation it can come as a relief to just find hay to purchase. That being said, it is still important to ask for a FEED ANALYSIS REPORT of the hay before you agree to buy. Among the consequences of wide scale lack of moisture is fields planted to produce a cereal grain crop become drought stressed and are reduced to a hay crop. The hay resulting from these intended cereal grains is potentially of excellent quality and feed value but sorghum (corn or milo) hay needs to be evaluated for nitrate levels. OSU Cooperative Extension Service Fact Sheet PSS-2903 offers a closer look at Nitrate Toxicity in Livestock. This fact sheet explains the levels of nitrates that are considered safe or dangerous, as well as feeding strategies for forage and hay supplies of varying nitrate levels.

Additional information gained through testing hay for nutritional content includes:

- Dry Matter and Moisture Content
- Crude Protein (CP%)
- Total Digestible Nutrients (TDN%) measuring the Energy level. Other estimates of energy obtained include Net Energy for maintenance, lactation and growth.
- Relative Feed Value (RFV)

This information can be used to compare "apples -to-apples" when buying hay. Forage quality varies not only among different plant species, but also within forage species. As well, forage quality of a specific variety can vary based on conditions such as soil fertility, drought stress and stage of maturity at harvest. For example: Bermudagrass hay can vary widely in nutritional content. If you had the opportunity to purchase Bermudagrass hay at $200/ton that tested 18% CP and 60% TDN or Bermudagrass hay at the same price that tested 7% CP and 55% TDN, which is the better buy? Both may appear the same to the naked eye but a nutrient analysis permits you to make the better buy. Furthermore it permits you to plan a feeding program knowing how much cows should consume and how much is needed to meet cows nutritional requirements. The same advantages hold true for hay you already have on inventory. The best single measure of forage quality is animal productivity. To ensure animal productivity, assess your forage supply and modify the animal diet before consumption. OSU Cooperative Extension Service Fact Sheet PSS-2117 offers deeper insight to Forage Quality Interpretations.

References:

https://extension.okstate.edu/fact-sheets/print-publications/pss/forage-quality-interpretations-pss-2117.pdf

https://extension.okstate.edu/fact-sheets/print-publications/pss/nitrate-toxicity-in-livestock-pss-2903.pdf

How Much Will It Cost to Feed Cows This Winter?

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

With widespread drought conditions and low hay supplies, hay is expensive this year. That alone will make winter feeding more expensive but there are things that producers can do to help manage winter cow feeding costs.

Markets for hay appear to be very dynamic with prices increasing rapidly. Hay is still commonly sold on a per bale basis and recently I have heard of prices for round bales in a range from $55 to $80 per bale. Precisely what cost that is depends on several factors. First is exactly what size are the bales. Common round bale sizes are 4x5, 4x6, 5x5, and 5x6. Next is bale density, which determines how many pounds of hay are in a bale. Round bales typically vary from 9 – 12 pounds per cubic foot. Table 1 shows variation in weight per bale, by bale size and density. Notice in Table 1 that a per bale price of $65 results in prices per ton of hay that vary from $92 to $230/ton.

Using a 5x5 bale, the weight per bale can vary from 884 pounds (density = 9 lbs./ft^3) to 1178 pounds (12 lbs./ft^3). At $70/bale, the cost of hay can therefore vary from $158/ton (7.9 cents/lb.) to $119/ton (5.9 cents/lb.). The only way to know is to weigh the bales. A fairly typical 1100 lb. 5x5 bale has a density of 11.2 lbs./ft^3 and a value of $127/ton ($70/bale) or 6.4 cents/lb.

How you store and feed hay will also affect the winter feeding costs. Very well managed round bales will have some losses in storage and feeding. Storage losses depend on how and how long bales are stored. Storage losses of five percent are possible for bales stored well and for short periods of time. bales. Bales stored on the ground and unprotected may see storage losses up to 40 percent or more. In a five-foot diameter bale, the outside 2 inches equals 13 percent of the dry matter in the bale, with 25 percent in the outer 4 inches. Bales on the ground will have losses due to moisture and deterioration where the bale touches the ground. Bales exposed to weather for any length of may see significant storage losses.

Losses typically occur in feeding of round bales. Well managed round bale feeding will typically experience up to 5 percent feeding losses. Bales fed in open pastures or in open ring feeders will experience significantly higher feeding losses, up to 30 percent or more. Bales fed in ring feeders with solid bottom rings, in cone feeders, or rolled out in clean pastures will experience less feeding loss.

A 1300-pound cow, mid-gestation, needs 23.4 pounds of dry matter (1.8 percent of body weight) per day. This equals 26.6 pounds/day as fed, assuming the hay is 88 percent dry matter. If we assume the best-case scenario of 5 percent each of feeding and storage losses and bales that weight 1100 pounds, the $70/bale hay will cost $1.87/cow/day. If storage and feeding losses are 40 and 30 percent respectively, the hay cost is 65 percent higher at $3.08/cow/day. The most likely situation for many producers is somewhere in between.

None of the above says anything about the quality of the hay and whether the hay is sufficient to meet the cow's nutritional requirements. Without a quality test, there is no way to know the extent to which the hay will meet the protein and energy requirements of the cow. Supplemental feeds are also expensive this year. Testing the hay and designing an appropriate feeding program will allow the most economical use of needed supplement without unnecessary winter feed expenditure.

Hay is very expensive this year. This makes it even more imperative for producers to **weigh it; test it and carefully store it and feed it**. Otherwise, it will be an even longer and more expensive winter.

Table 1 Round Bale Weight by Size and Density (Pounds) and Cost per Ton at $65/Bale.

	Density (lbs./ft^3)			
Bale size (width x height, ft)	9	10	11	12
4x5	565 ($230)	628 ($207)	691 ($188)	754 ($172)
4x6	679 ($192)	754 ($172)	829 ($157)	905 ($144)
5x5	884 ($147)	982 ($132)	1080 ($120)	1178 ($110)
5x6	1060 ($123)	1178 ($110)	1296 ($100)	1414 ($92)

Pastureland Values in Oklahoma

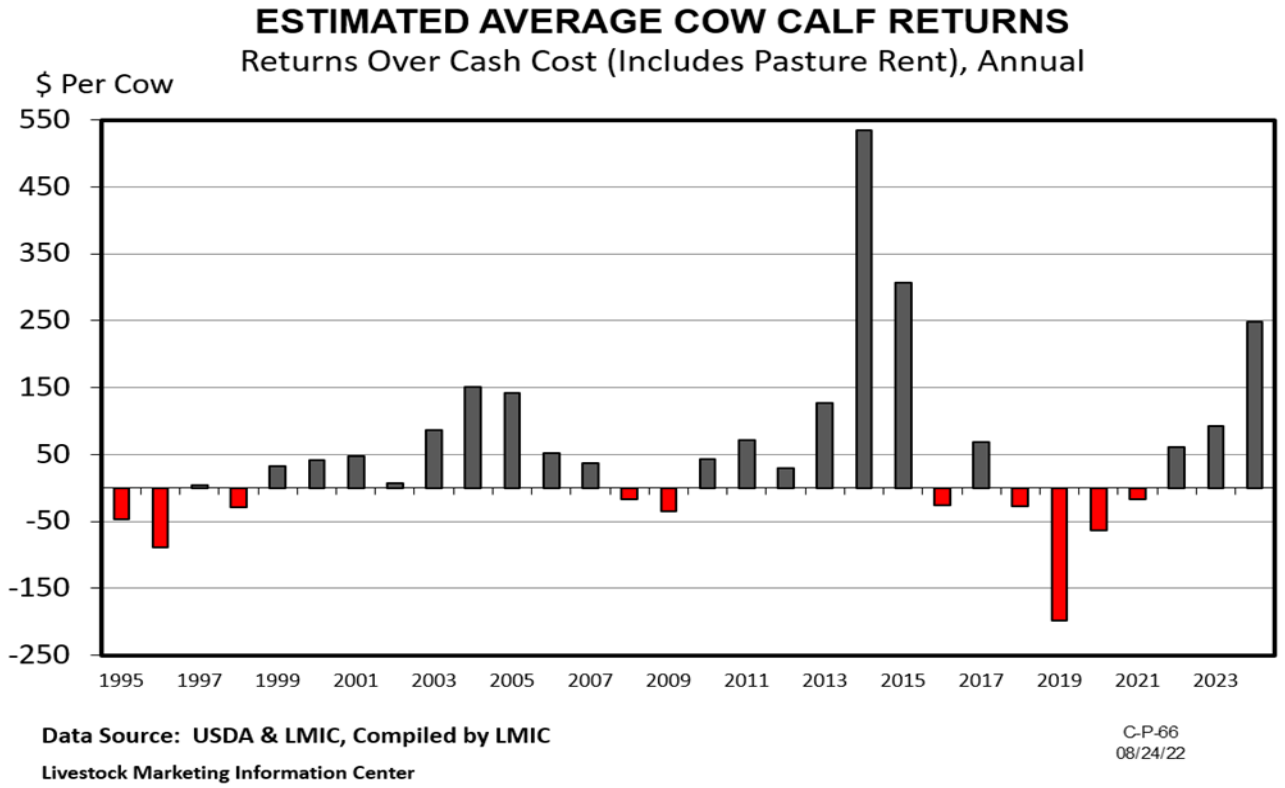
Roger Sahs, Extension Specialist, OSU

The latest trends and patterns in Oklahoma's agricultural real estate market have been updated through 2021 and can be found at: https:// extension.okstate.edu/ programs/farm-management-and-finance/oklahoma-land-values/ The Farm Credit Associations of Oklahoma provided sample data representative of the 2021 land transfer market of which roughly 1,700 sales tracts were examined. Statewide statistics, regional comparisons, and county summaries are shown in chart and tabular form. This information offers a perspective into the characteristics of recent sales as well as benchmark indicators when studying trends over time. We hope you will find it useful as a go-to source of information related to the farmland markets in Oklahoma.

The recent performance by the livestock economy (namely cattle) and future earnings expectations carry a great deal of weight on the pastureland market in Oklahoma. Pastureland values have shown consistent growth since the 2009 recession and 2021 was no exception. Values grew an impressive 20.7% last year on top of a rather modest 2.5% in 2020 when the adverse effects from COVID created considerable uncertainty in the general economy. The farmland markets in 2021 profited from higher commodity prices, low interest rates, and increased interest as a hedge against inflation by investors. Despite challenging operating margins, returns in the cow-calf sector in the beef cattle economy are expected to improve, according to the Livestock Marketing Information Center (See Figure 1). However, the strength and potential duration of the current drought in Oklahoma will pressure returns given the adverse impacts on forage conditions and hay supplies. This proverbial fly in the ointment has a large capacity to slow the pace of growth in the land markets going forward.

There are additional sources of land value information available that provide further insight into the markets. Reports by USDA- NASS (https:// www.nass.usda.gov) and the Federal Reserve Bank of Kansas City (http://www.kc.frb.org) are survey- based impressions of the market. They complement our study by presenting insightful comparisons and contrasts when exploring the dynamics of the land markets.

In conclusion, a good understanding of the land markets can help active and prospective participants make sound decisions grounded on reality and not just emotion. Should you have questions, contact Roger Sahs at roger.sahs@okstate.edu for additional information.



Fescue Foot

Barry Whitworth, DVM , Area Food/Animal Quality and Health Specialist for Eastern Oklahoma

Since most of Oklahoma experienced drought conditions and with fall fast approaching, producers with fescue pastures should closely observe their livestock for any signs of fescue toxicity. According to Mike Trammel, Pottawatomie County Ag Educator and Muti-County Agronomist, fescue toxins (ergot alkaloids) tend to increase in Kentucky-31 tall fescue pastures in the fall. Some reports indicate more problems with fescue toxins following a summer drought and limited fall rains. All of this may put Oklahoma cattle at a greater risk of fescue toxicity.

One issue that cattle experience with fescue toxins is fescue foot. Fescue foot is thought to be caused by ergot alkaloids such as ergovaline. These alkaloids are produced by endophyte fungus (*Epichloë coenophiala*) which is in tall fescue. Ergovaline has been proven to be a vasoconstrictor which might be responsible for fescue foot and heat intolerance also known as summer slump in cattle. Other issues that may be seen with the ergot fescue toxins are reduced milk production and reproductive issues.

Clinical signs of fescue foot appear within a few days of cattle being turned on to tall fescue pastures or it may take weeks if toxins in the pasture are low. Producers will initially observe cattle with arched back, rough hair coats, and sore feet. These symptoms are more noticeable early in the morning and with cold weather. This is followed by reddening and swelling in the area between the dewclaws and hooves. The lameness usually becomes more severe with time. If no action is taken, gangrene will result in loss of tissues distal to the coronary band and declaws. If the weather remains mild, other signs such as increase respiration rate, increase heart rate, and higher body temperature are more common.

Other causes of lameness in cattle must be differentiated from fescue foot. One simple method that will help differentiate fescue foot from footrot is to check the temperature of the foot. If the foot is cold, this is an indication that the problem is more likely fescue foot.

Since there is not a specific treatment for fescue foot, the condition must be managed. Cattle need to be observed daily for any signs of lameness or stiffness during the first few weeks on fescue pastures. This should be done early in the morning before cattle walk off the stiffness. Producers should pay close attention during cold weather, especially when rain, snow, or ice are present. Any animal showing clinical signs of fescue foot should be removed from the pasture and placed in a clean environment. The animal should be fed a ration with no fescue toxins.

The best but most costly solution to reduce fescue toxicity is to renovate old pastures with new endophyte friendly varieties. If this option is not possible, producers might try interseeding fescue pastures with clovers or other grasses. This should dilute fescue toxins. Nitrogen fertilization may increase ergot alkaloids, so producers should avoid fertilizing fescue pastures with high amounts of nitrogen. Researchers have demonstrated that feeding a supplement while grazing fescue pastures reduces clinical symptoms. Some studies indicate a difference in susceptibility to fescue toxicity in some cattle. Selecting cattle based on genetic tolerance of fescue toxins is an option. (For more information go to www.agbotanica.com/t-snip.aspx)

With large areas in Oklahoma covered with Kentucky-31 fescue pastures, fescue foot as well as other fescue toxicities are not going away any time soon. Livestock producers will need to watch their livestock closely for any signs of fescue toxicity and manage their pastures to keep toxins as low as possible. If producers would like more information on fescue foot, they should consult their veterinarian and/or visit their local Oklahoma State University Cooperative County Extension Agriculture Educator.

Oklahoma City's Stockyard City is the home of the largest stocker/feeder cattle market in the world, Oklahoma National Stockyards. Since it opened in 1910, more than 102,000,000 head of livestock have passed through its iron gates.

Early Weaning Data Collection, and Culling Decisions

Brian Freking, Southeast Area Livestock Specialist

Unfortunately, during drought conditions tough decisions need to be made and early weaning is a legitimate strategy. This can bring challenges to measuring and comparing cow performance when making culling decisions, as some breed associations may have different weaning age bases for expected progeny differences (EPDs). For example, breed association guidelines for weaning ages used in EPD calculations for an Angus calf is 120-280 days, but 100-260 days for a Chiangus calf. In both cases, for calves to be eligible for the same contemporary group, weaning dates cannot be more than three days apart and weaning weights are required for carcass ultrasound data to process. Requirements for cow data is the same across breeds for inclusion in EPD calculations. Cow weight and body condition score must be recorded within +/- 45 days of calf weaning date and is used to calculated mature-size EPDs. The cow's calf must also have a weaning weight recorded. Any cow weight without a body condition score will not be used in the National Cattle Evaluation. If the cow is being culled, record the date and reason for culling.

Tracking cow performance is important. Remember - "***You can't manage what you don't measure***." Regardless of breed or participation in EPD data collection, all beef cow-calf operations can evaluate cow performance with simple calculations that start with adjusted weaning weight or an index. Weaning weights are used to evaluate differences in growth potential of calves and milking ability of dams. To evaluate differences in weaning weights, individual calf records are adjusted to a standardized basis. The Beef Improvement Federation (BIF) recommends that weaning weights (WW) be standardized to 205 days-of-age and a mature age-of-dam basis. The equation below standardizes your weaning weights to a 205 days-of-age weaning weight:

$$\text{Adj 205 Wt} = \frac{Weaning\,Wt - Birth\,Wt}{Age\,at\,Weaning\,in\,Days} \times 205 + Birth\,Wt$$

Several commercial products are available for record keeping and make the Adj 205 Wt calculation. There are some free resources for adjusted 205 Wt calculations. Iowa State's calculator is available at https://www.iowabeefcenter.org/calculators.html and Cattle Calculator has a weaning weight calculator available at https://www.cattlecalculator.com/adjusted-weaning-weight-calculator/, just to name a couple.

To compare birth weights (BW) between a first-calf heifer and a mature cow, use the information in Table 1 to calculate this trait adjustment. For example, if the heifer has a bull calf weighing 72 pounds at birth and a 5 year old cow has a heifer calf weighing 75 pounds at birth, Table 2 shows that adjusted calf BW is actually higher for the heifer than for the mature cow. Note that some breed associations may have different adjustment factors.

Table 1. BIF Standard Adjustment Factors for Birth and Weaning Weight

Age of Dam	BW	Male WW	Female WW
2	+8	+60	+54
3	+5	+40	+36
4	+2	+20	+18
5-10	0	0	0
11+	+3	+20	+18

Note: Some breed associations may have different adjustment factors.

Assume the calves were both born on March 1 and weaned July 29 at 150 days old. To compare weaning weight performance between the heifer and the mature cow, we use the adjusted 205 days-of-age weaning weight. The formula uses *actual* BW, plus *actual* weaning weight, and a sex of calf adjustment to weaning weight for each calf and dam.

Good records can make culling decisions a little less stressful. Based on the adjusted 205 weaning weight in the example, we can see the younger cow is more productive even though the calf's pay weight was 25 pounds lighter. This kind of information can provide objective input into cow performance and help inform difficult culling decisions.

Table 2. Cow Age BW Comparison

	Actual BW	**Adjusted BW**
Heifer	**72**	**80**
5 YR old Cow	**75**	**75**

Table 3. Adj 205 Wt Comparison example

Cow Age	Calf Sex	BW	WW	Adj. 205 WT
2 (1st calf heifer)	Bull	72	500	717
5	Heifer	75	525	690

Energy Balance and Milk Production in Beef Cows

Dave Lalman, Animal Science, Professor

Extended periods of drought serve as a reminder of the importance to match cows to the ranch's forage resources. Genetic capacity for milk production is one major factor in creating a good match. Most producers recognize that too much genetic capacity for milk production can lead to thin cows resulting in reproductive failure or the need to intensify the use of expensive purchased or harvested feeds. While too little milk should result in cows staying in better condition during tough drought years, weaning weights are sure to decline in years when forage production is abundant.
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The primary tools available to change the genetic capacity for milk in the cow herd are breed selection, milk EPD within each breed, and crossbreeding. Crossbreeding results in an increase in milk production through heterosis. Remember that within a breed, milk EPD reflects the "maternal influence" or an indication of the dam's influence on calf weaning weight. Certainly, a portion of her influence is the amount of milk energy she produces for her calf every day. However, a calf's mother could provide a lot of other things besides milk that may influence her calves' weaning weights. This is an interesting topic for another day. Regardless, when one continually purchases sires with higher milk EPDs, at least some of the increase in their daughters' calf weaning weights can be attributed to increased milk energy yield.

For perspective, during the last trimester, a 1,300 lb. cow in good body condition requires about 3.3 megacalories of net energy for maintenance (Mcal NEm)to support her pregnancy along with 9.4 Mcal NEm for maternal tissue maintenance. Peak milk yield generally occurs 4-6 weeks after calving. Assuming average genetic potential for milk production, about 8 Mcal NEm are required to support lactation. In addition, maintenance energy requirements increase by about 20% during lactation resulting in maternal tissue maintenance requirement of 11.3 Mcal NEm per day. Therefore, to produce 24 lb. milk and maintain maternal tissue, 19.3 Mcal NEm are required. This is about the same amount of energy contained in 47 lb. of average quality prairie hay or 20 lb. of rolled corn.

If diet quality or feed availability limit this lactating cow to lower daily energy intake for several days, two things will occur. First, average daily milk yield will decline. Milk yield is highly sensitive to the availability of energy. At the same time, the cow will begin to lose weight. On the other hand, if diet quality and availability allows greater than 19.3 Mcal NEm intake, milk yield should not change (assuming the cow is already at her genetic capacity for milk production) and she should gain weight. Interestingly, in all the work we have conducted here at OSU studying milk production in beef cows, we have never found a situation where increasing energy intake did NOT increase milk production. What does that tell us? It basically indicates that the grazing environment limits milk production. It is not the genetic capacity of the cattle that limits milk production.

Increased energy intake might be achieved by providing better quality hay, more concentrate supplement, shifting calving season to occur during pasture green up, etc. In some of our work, about 60% of increased energy intake (increased above that provided by lush spring forage) was partitioned to milk production and the remaining 40% was partitioned to maternal tissue gain. Clearly a genetic by environment interaction exists. In other words, with greater genetic potential for milk, a greater proportion of the "increased" or "supplemental" energy goes to prop up milk production and less goes to the cow to gain weight (or perhaps to keep her from losing weight).

Another important piece of the puzzle is the influence of genetic capacity for milk yield on forage intake. Feed or forage intake capacity is limited. Our recent data suggests that each one lb. increase in milk production is associated with 0.3 to 0.4 lb. increase in forage intake.

How do you know where the sweet spot in terms of genetic potential for milk production and your forage system? An excellent resource is the American Angus Association's Optimal Milk Module. You can access this online tool at angus.org/Performance/OptimalMilkMain With just a few inputs, this decision tool provides guidelines for sires with milk EPDs appropriate for your grazing and management system. For other breeds, across breed adjustment factors can be applied to these Angus-based EPD guidelines.

Farm Transitions in Five (Not So) Easy Steps

Shannon L. Ferrell – Extension Specialist, Agricultural Law

Over the past two newsletters, we presented a number of the challenges in successfully transitioning the ranch from one generation to the next. "Great, we agree it's a challenge; what am I supposed to do about it?" The good news is that there are just five steps to help your operation plan its generational transition. These five steps can be challenging, but they also create an opportunity to create a plan that works for everyone involved.

Step 1: Figure Out Where You Are Now

Like the song says, "let's start at the beginning." Perform the most comprehensive inventory you ever have on all of your assets, both physical and financial. Round up every deed to every piece of property, every lease (you do have a written lease for every land lease, right?), every title document for every vehicle, serial numbers for non-titled equipment, numbers and descriptions of inventories of products, inputs, and livestock, account numbers and institutions for financial assets… the list goes on. Don't stop with these assets, though. Inventory your human assets. Who has an economic connection to the farm? Who has an emotional connection to the farm? Who are your vendors and customers? Find all the pieces to your transition puzzle before **you** start putting it together.

Step 2: Communicate

Farmers and ranchers might not be the world leaders in communicating their feelings to their families, but the importance of open and honest communication in a successful transition process cannot be overstated. Many people have a goal of minimizing fights in a transition, but that goal is doomed if the family does not communicate. Conversely, numerous studies show if people feel they had a fair chance to be heard and were respected in a process, they are much more likely to accept the outcome of that process even if it wasn't the outcome they desired. So, start by talking to all of your stakeholders - beginning with everyone who has an economic and/or emotional connection either to your farm or to ranch - and ask them two questions: (1) What do you see as the future of this farm or ranch? (2) What do you see as your role in that future? Clearly communicate that you want an honest answer, and listen without judgment to the response – those answers might surprise you. From that point, keep the lines of communication open and engage every stakeholder at some point. Don't exclude emotional stakeholders either – doing so could create an incentive for them to disrupt the process or its outcomes.

Step 3: Create a Plan for Moving the Business

Every single Fortune 500 company has a plan for how the business will continue after the loss of their CEO whether that loss comes from an accidental death tomorrow or a retirement after a long and fruitful career. Your farm or ranch deserves the same. You need a plan to transition at least three critical pieces of your operation: (1) ownership of the assets upon which the operation depends, (2) management control over those assets, and (3) the experience you have gained from a lifetime of working with the enterprise. Many people think about (1), some occasionally think about (2), and almost none intentionally do anything about (3). A successful transition requires all three. As you examine how to move business assets, consider doing so both while you are alive and also as part your estate plan, as this gives you the opportunity to both recognize the contributions of stakeholders that are currently actively engaged with the farm and to share your operational experience while you are alive. Additionally, as we have mentioned in the previous articles, giving identical interests in farm or ranch assets to people who have made drastically different contributions to the operation may be equal, but it is almost certainly not equitable. That said, ask off-farm stakeholders if they want an opportunity to be involved with the farm even if they can't be there every day. This may mean having an investment of capital at-risk in the business. Doing so turns participation in the farm (and eventual ownership of some or all of its assets) as an opportunity to grow the wealth of the operation rather than an entitlement to the wealth created by those who work there.

Step 4: Get Your Estate Plan in Order

You saw them in the March article, folks. Everyone (yes, that includes you) needs to have: (1) a guardian nomination for any children under the age of 18, (2) beneficiary designations on their investment/savings accounts, (3) durable powers of attorney for business and healthcare, (4) an advance directive for healthcare, (5) a plan for long-term care (such as a nursing home or assisted living arrangement) and (6) a will. For

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Farm Transitions in Five (Not So) Easy Steps (cont.)

many people, a trust may also be a critical tool for expediting the distribution of assets, avoiding probate, or keeping farm assets together.

Step 5: Review, Revise, and Repeat

You made it through all four steps so far, but don't stop there! Things like people, balance sheets, and laws can change. Thus, go back and check on all of your transition plans every time one of the following happens: (1) a stakeholder is born, dies, or otherwise enters or leaves the picture, (2) anytime a stakeholder gets married or divorced, (3) any time there a major asset is acquired or disposed of (4) any time there is a major legal change that affects any of your transition tools, and (5) at regular intervals of at least every two years.

Last, and certainly not least, make sure you assemble a good team with an attorney, accountant, financial advisor, and mediator/meeting facilitator, all of whom are well versed in the unique challenges of agriculture. You and your family may have worked for generations to build this operation, so don't try to "go cheap" on carefully handing it to the generations to come.

Nonfood Products from Cattle

- **More than 100 medicines used by humans come from cattle.**
- **One cowhide can produce enough leather to make 20 footballs, 18 soccer balls, 18 volleyballs or 12 basketballs.**
- **NFL footballs are made of cowhide. About 3,000 cowhides are required to make footballs for one season.**

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