The Latest Across the Plains

Timely Reminders

- Keep pen box scraped.
- Haul manure whenever possible.
- Have your calving facilities and OB equipment ready.
- Have the right mineral for your cows' stage of production.
- Prepare now so your Hi-mag and Fly control minerals are on hand.
- Semen check bulls and make sure they are in adequate body condition.
- If you are in a high anaplasmosis area, begin talking to your vet now about a VFD.
- Target a BCS of 5.0-5.5 on mature cows and 5.5-6.0 on heifers at calving.
- Be sure to adjust cow nutrition to match requirements as they calve.
- Make sure waterers are clean and in good working order.
- Decide which implant you will use on calves.

Welcome, Robert Jones!

Great Plains Livestock Consulting, Inc. would like to announce the addition of Robert Jones, M.S. as a new In-House Nutritionist! Robert grew up on a cow-calf operation in Southwest Missouri. He received his Bachelor's degree in Animal Science from Oklahoma State University in 2015 and his Master's degree from the University of Nebraska-Lincoln in Ruminant Nutrition focusing on feed additives and residue grazing in beef cattle. Having experience in multiple facets of the industry coupled with practical knowledge, Robert works for GPLC, Inc. as an In-house Nutritionist and looks to help producers meet their bottom line economically and with sound decisions.

Welcome, Jordan Burhoop!

Great Plains Livestock Consulting, Inc. would like to announce the addition of Jordan Burhoop, M.S. as a new In-House Nutritionist! Jordan grew up in Eastern Nebraska where he developed a passion for the livestock industry through 4-H and working alongside area producers. He graduated from the University of Nebraska-Lincoln with a Bachelor's degree in Animal Science. He then participated in the UNL Feedyard Management Internship. Upon completion, Jordan returned to the University of Nebraska-Lincoln where he received his Master's degree in Ruminant Nutrition. He joined Great Plains Livestock Consulting, Inc. in January 2018 and looks forward to assisting producers and nutritionists in their day-to-day activities.

Unused Feed

"Agriculture is our wisest pursuit because it will in the end contribute most to real wealth, good morals, and happiness." — Thomas Jefferson

Save Money $$$ Test Your Feeds

Tests are relatively inexpensive, usually costing less than $18, for the information derived. Contact our office to set up an appointment to have us pull feed samples if we have not done so yet.

Calendar of Events

- **Mar 12 - 14** Midwest ASAS, Omaha, NE
- **Mar 22 - 24** 3i Show, Dodge City, KS
- **Mar 23 - 25** Cattle Raisers Convention & Expo, Fort Worth, TX
- **Mar 27 - 29** Mid America Farm Expo, Salina, KS
- **Mar 27 - 29** Wisconsin Public Service Farm Show, Oshkosh, WI
- **March 29** Eastern Oklahoma Beef Cattle Summit, McAlester, OK
- **Apr 4 - 6** Great Bend Farm and Ranch Expo, Great Bend, KS
- **Apr 10 - 11** National Institute for Animal Agriculture Annual Conference, Denver, CO
- **Apr 17 - 18** Montana Nutrition Conference and Livestock Forum, Bozeman, MT
- **Apr 19 - 21** Oklahoma City Farm Show, Oklahoma City, OK

The Great Plains News Feed

The Hot Topic: Vitamin A

Jordan Burhoop, M.S. in collaboration with Karl Harborth, Ph.D.

Vitamin prices, particularly vitamin A, have been the subject of many conversations over the last couple of months due to a large decrease in global supply. The shortage of vitamin A is due to several factors that all came together at approximately the same time. A fire in October 2017 at BASF's Citral plant in Germany, where precursors used in the production of vitamin A are manufactured, had a major impact on the industry's supply. This plant is the second largest vitamin A producer in the world with their output serving approximately 26% of the global vitamin A for the feed grade sector. BASF also supplies precursors to other manufacturers that produce vitamin A. When all of these sectors are added together, BASF supplies precursors that affect approximately 40-45% of the global vitamin A feed grade sector. Supplies of vitamin A were tight before the fire in Germany, so further reduction in supply came at an already difficult time for the industry. Last summer, China significantly lowered their output of vitamin A due to new environmental regulations. The world's largest producer of vitamin A, DSM, announced that they were going to undergo extended maintenance shutdowns during 2017 and late 2018 and said that product availability is going to be affected. These three situations have led to extremely high prices, with some vitamins being very difficult to obtain. BASF has set up a website (https://nutrition.basf.com/en/Citral-plant.html) to keep customers informed on their rebuilding process and when they anticipate being able to ship their products. The Citral plant in Germany is expected to start up in March 2018 at the earliest, with the startup procedure expected to take several weeks. Once Citral production has been initiated, downstream precursors for vitamin A are expected to be available for shipment approximately 6 to 12 weeks after start up and it could take weeks or months to ship products overseas.

Vitamin A plays a very important role in many different processes throughout the body and a deficiency can have a large impact on an operation's bottom line. The main function that almost everyone identifies as being linked to vitamin A is night vision; however, many other functions exist. Vitamin A is involved in transcription of DNA to mRNA, growth, reproduction, bone development, and immunity. The exact mechanisms of these functions are unclear, but the process likely has to do with gene expression. Vitamin A is also important in cellular differentiation and epithelial cell structure by maintaining delicate tissues lining the respiratory, digestive, and reproductive tracts, keeping them pliable and in good working order. Immature skin cells require a form of vitamin A to develop into epidermal cells.

With all of these important processes occurring in the body, it is important to supply the correct amount of vitamin A to the animal. If the animal becomes deficient in vitamin A, there will be many different symptoms. Although ruminants can store a six-month supply of vitamin A in the liver, you do not want to count on more than a two to four-month supply being available to the animal because you do not want to get behind on their requirements. Vitamin A deficiency is more likely to occur when cattle are fed high concentrate diets, when low quality hay is fed, when feeds are excessively exposed to sunlight, heat, air, or if feeds are heavily processed. Some of the symptoms that might be observed are night blindness, hardening of epithelial cells, watery eyes, rough hair coat, swollen legs, increased risk of urinary calculi, incoordination followed by paralysis, reduced average daily gain, and reduced feed efficiency. Vitamin A deficiency will cause cells that are hard and used for protection to replace mucus-secreting cells, which will cause the cell to become more brittle and increase susceptibility to infection. If the lining of the gastrointestinal tract is hard and brittle, nutrients cannot be absorbed efficiently. A deficiency may cause sloughing of epithelial cells lining the urinary tract, which provides a base for calcium to bind and stones to develop. Many different reproductive disorders might also be observed, such as late term abortions, retained placentas, stillborn calves, poor vigor of calves, low male libido, and low sperm motility. Young calves may show symptoms within two to four weeks of birth, while the dam may appear healthy if fed a ration low in vitamin A during gestation.

Vitamin A requirements have been heavily researched for many years. The current requirements from Nutrient Requirements of Beef Cattle (2016) are 998 IU/lb. of dry feed or 21 IU/lb. of BW for beef feedlot cattle, 1270 IU/lb. of dry feed or 27 IU/lb. of BW for pregnant beef heifers and cows, and 1769 IU/lb. of dry feed or 38 IU/lb. of BW for lactating cows and breeding bulls. Many nutritionists include an additional margin of safety when it comes to supplementing vitamin A because of the importance it plays in the animal. With current prices increased by a factor of 15, it is not recommended to feed levels above the requirements stated above. Numerous studies have been conducted that have compared cattle fed vitamin A at required levels versus elevated levels (Hill et al., 1995, Zinn et al., 1996, Pyatt et al., 2005, Bryant et al., 2010). These studies did not show an improvement in performance when elevated levels were fed in the ration, and some even reported better performance in cattle fed vitamin A at required levels. Although prices are high, the cost is small compared to the value vitamin A brings in terms of productivity and quality. Required supplementation levels need to be maintained, especially in young and gestating animals, to avoid adverse effects on animal welfare and production of the herd. If the supply situation continues to worsen, supplementation levels in terminal animals should be lowered before any other animal class.

The best source of vitamin A is beta-carotene, which is a pigment in green plants that animals then convert to vitamin A. Cattle that are grazing green grass should consume enough vitamin A to meet their nutrient requirement and do not need to be supplemented. Natural levels of vitamin A decrease during drought conditions or in late winter/early spring, which can lead to a deficiency. Vitamins lose activity in forages quickly after they have been harvested, with 70% of activity being lost after six months of storage. The only ingredient that has an appreciable amount of vitamin A in cattle rations is corn grain; however, not enough is supplied to meet requirements, so additional supplementation is required. Supplementation levels may need to be increased in hot weather, periods of disease, or if parasitic stresses are affecting the animal because these factors are believed to interfere with the animal's ability to convert carotene to vitamin A.

Vitamin A plays a large role in the cattle feeding industry and is an area that needs to be managed properly to maintain profitability. If there are any further questions about supplementation levels or management strategies, please feel free to contact your GPLC nutritionist.

Sire Selection: Don't Get Lost in the Numbers

Robert Jones, M.S. in collaboration with Chris Muegge, M.S.

The amount of information available to producers at the touch of a button is overwhelming and can seem intimidating when trying to make sound production decisions for your operation. Both the cow and the bull contribute equally to the genetic makeup of the offspring; however, the sire has a much larger impact on the genetics of the entire calf crop. A single bull could potentially influence the genetics of up to 50 calves in a single season, while a cow will only influence her own. These numbers continue to multiply as we look at the influences spread out over the lifetime of that sire. In herds where replacements are retained, the last three sires used represent 87% of the calf crop's genetic makeup. It is because of this, selection of an inferior bull will impact herd genetics and quality long after that bull has left the farm. My objective of this article is to help you sift through the wealth of data available on bull selection and describe some tools to assist you in making the best decisions to improve the future profitability and efficiency of your herd.

When deciding on what bull to buy at the next bull sale or straw of semen to purchase, there are many factors that play a role in your overall decision. Several resources are available to help you make the best decision outside of phenotypic (physical appearance) evaluation. Phenotypic evaluation is a very subjective measure of a bull's worth that is variable from person to person and many factors can impact the condition of an animal. Previous plane of nutrition, environment, management that is potentially suppressing, or improving the genetic potential of that bull can greatly impact phenotypic evaluation. I would agree that numbers cannot stand alone, as visual evaluation of structural integrity is hard to evaluate off a piece of

paper; however, it is important to keep in mind non-genetic factors and the impact those might have. When looking for an estimator of true breeding value, expected progeny differences (EPD's) are a selection tool many producers and animal breeders lean on. Expected progeny differences provide purebred and commercial producers alike the ability to compare performance traits between individuals within a breed.

When thinking about genetic selection, it is important to identify what affects your herd's profitability; taking into consideration your production goals, market targets and environment. An animal could have all the genetic potential in the world; however, if resources are not available to match, then the animal's potential will not be realized. Whether raising replacement females that are earlier maturing, lengthening the production life of those animals or raising calves that you will sell as yearlings to a feedlot for finishing, thereby placing more emphasis on efficient growth, it is important to outline production goals specific to your operation. Factoring in your environmental conditions is critical as what works in one geographic region may not work in another. Knowing your cow herd is important. Maintenance requirements of cows are based on a multitude of factors such as breed, age, size, weather, etc. and it is difficult to determine exact numbers; however, having an understanding of your herd's maintenance requirements by knowing your production environment and resource availability can help narrow down traits to consider. Once you have determined where your points of profitability lie, EPD's have the opportunity to help you make a sound buying decision.

Expected progeny differences provide a lot of information and can be confusing to decipher at first, but with a basic understanding of what an EPD is, they can provide a valuable service. At base level, EPD's are divided into three categories: production (Birth weight, Weaning weight, Yearling weight, etc.), maternal (Maternal milk EPD, Mature weight EPD, Calving ease maternal EPD, etc.), and carcass (Carcass weight EPD, Ribeye area EPD, Fat thickness EPD, etc.). An EPD is a prediction of how future progeny of a specific animal are expected to perform. Expected progeny differences are not exact but become more and more accurate as more information becomes available on the progeny of that specific bull. Expected progeny differences can only be compared within the same breed; however, the U.S. Meat Animal Research Center (USMARC) located near Clay Center, NE develops adjustment factors annually for 18 beef breeds that allow producers to compare EPD's across breeds and are referred to as across-breed adjustment factors (AB-EPD's; table shown below). Expected progeny differences cannot be compared across different breeds without using adjustment factors, as each breed association has their own data set of which they compare each sire against, to produce EPD's. Expected progeny differences are expressed as a number with a plus or minus signifying the units of measure for the specific trait. The accuracy value is the reliability that can be placed on that EPD; the closer the number is to one the more accurate or more reliable that EPD is. Expected progeny differences for younger bulls are typically less reliable compared to a more proven sire, as accuracy is influenced by the number of progeny and ancestral records available and thus their EPD will have an "I" preceding it. Genomic-enhanced EPD's provide another level of accuracy to better characterize a bull's genetic merit. Several breed associations have incorporated genomics directly into their EPD's as a single selection tool. Genomic-enhanced EPD's can be used in the same fashion as an EPD to compare sires, the difference is genomic-enhanced EPD's provide an additional level of accuracy. Genomic values are determined through a DNA test utilizing a tissue sample collected from an animal. A process known as marker assisted selection (MAS) uses the variation in an animal's genotype, single nucleotide polymorphisms (SNP), to predict the phenotype of an animal or its offspring. Genomic results are not meant to replace phenotypic data such as birth weight, carcass traits or ultrasound. Instead, genomic values are indicator traits that are to be used in conjunction with phenotypic data to influence the accuracy of a trait. Genomic-enhanced EPD's minimize risk by increasing the confidence level of an EPD, especially in young sires. Research estimates show that EPD accuracy is improved greater than 20% through use of genomic testing.

Market targets or goals are important to establish, for example if you are selling your calves at weaning it is not as important for your operation to focus on carcass traits as someone who is going to retain ownership of those calves through the feedlot. Economically relevant traits (ERT's) are important to distinguish and will help simplify your bull buying experience. Economically relevant traits as described by Golden and others (2000) are traits that directly affect profitability by being associated with a specific cost of production or a revenue source with indicator traits helping to add information to the prediction of economically relevant traits. Simply put, a trait is considered an ERT if the performance of that trait is changed and either the income or expense is changed as well. Most ERT's are comprised of multiple indicator traits resulting in one value to ease the selection process. An example of this would be calving ease and birth weight. Calving ease is the ability of the female to have an unassisted birth which has a direct impact on the income of the operation and is considered an ERT; whereas, birth weight is an indicator trait that may play a role in dystocia of a female however, other factors such as cow size can influence the calving ability of the female. To take this one step further, selection indices are another tool that can be used to improve your decision process. $Value indexes are economic multi-trait selection indices that estimate, on a dollar per head basis, how the future progeny of a sire will perform compared to the breed sire average with an economic weight assigned to each EPD. Selection indices take in to account both EPD's and ERT's resulting in a dollar value per head, which allows producers to use one value and determine whether that $ index is important to the production objectives of their operation. A producer who retains ownership of their calves through the feedlot would be interested in the $feedlot index and potentially $grid value compared to $weaned calf value as this index does not meet their target market. Ultrasound data can provide an additional piece of information when evaluating carcass characteristics of a sire. It is important to remember that if presented with raw ultrasound data, that those values only represent a snapshot in time that could be influenced by environment and management. Ultrasound EPD's are a valuable tool to use in sire selection for operations with carcass driven production goals. Age requirements are set by breed associations for ultrasound measurements, to provide a fair comparison between sires. Collected ultrasound data is used by breed associations to calculate ribeye area and percent intramuscular fat (marbling) EPD's.

Sire selection tools are becoming more and more available as breed data sets are developed year after year and the potential with genomics and other technologies is improving the decision process for producers. It is important to develop a relationship with a seedstock producer that you can trust, that produces bulls that meet your production system goals and are raised in a similar manner/environment as your operation. An important fact to remember is that EPD's do not make up for poor management or phenotypically poor cattle. It is important to provide a proper plane of nutrition and implement a vaccination protocol. Please contact us to discuss recommendations on how bull selection will impact your specific operation and your bottom line.

TABLE 1: ADJUSTMENT FACTORS TO ADD TO EPDs OF EIGHTEEN DIFFERENT BREEDS TO ESTIMATE ACROSS BREED EPDs

Breed	Birth Wt. (lb)	Weaning Wt. (lb)	Yearling Wt. (lb)	Maternal Milk (lb)	Marbling Score[a]	Ribeye Area (in^2)	Fat Thickness (in)	Carcass Wt.(lb)
Angus	0.0	0.0	0.0	0.0	0.00	0.00	0.000	0.0
Hereford	2.3	-7.8	-28.6	-17.3	-0.31	-0.07	-0.056	-59.0
Red Angus	2.5	-31.4	-34.6	3.3	-0.27	0.01	-0.016	-9.0
Shorthorn	4.7	-36.6	-17.3	4.1	-0.14	0.37	-0.105	-7.1
South Devon	3.3	-11.4	-27.1	3.9	-0.08	0.29	-0.133	-24.8
Beefmaster	4.7	17.9	0.5	5.9				
Brahman	10.3	45.1	6.6	23.8	-0.78	-0.05	-0.145	-27.8
Brangus	3.3	12.0	4.0	6.3				
Santa Gertrudis	5.7	36.3	43.0	17.0	-0.54	-0.09	-0.080	2.2
Braunvieh	1.9	-25.5	-50.0	-0.8	-0.70	0.78	-0.092	
Charolais	8.0	34.6	40.4	8.2	-0.33	1.01	-0.208	13.0
Chiangus	3.2	-27.0	-40.5	-1.7	-0.34	0.34	-0.093	-18.1
Gelbvieh	2.8	-22.6	-29.3	2.3	-0.27	0.75		-15.0
Limousin	2.3	-18.2	-41.3	-13.7	-0.43	1.01	-0.132	-12.0
Maine-Anjou	4.2	-30.5	-38.7	-6.2	-0.57	0.97	-0.187	-15.9
Salers	1.8	-7.3	-25.7	5.9	-0.09	0.94	-0.196	-23.5
Simmental	3.2	-9.4	-12.1	4.4	-0.34	0.49	-0.129	4.4
Tarentaise	3.4	25.1	5.6	24.2				

[a]Marbling score units: 4.00 = Sl^{00}; 5.00 = Sm^{00}

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