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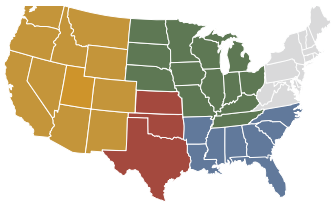

Southern Great Plains

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Vitamin A is considered by many nutritionists and veterinarians to be the most important supplemental vitamin required in beef cattle production. Several of my veterinarian colleagues have expressed concern about stillborn births and a potential link to inadequate vitamin A.

In fact, two have recently noted 80-100% of blood samples from cows with stillborn births tested inadequate for vitamin A.

Plant materials contain the provitamin carotene that is converted to active vitamin A by the animal. Green, leafy forage; green hay; dehydrated alfalfa meal; and yellow corn are examples of rich sources of carotene. Lush, immature forage is especially high in carotene concentration. However, carotene is destroyed rapidly as the plant matures with exposure to sunlight, air and high temperatures.

Vitamin A activity also declines over time in stored harvested forage. Cattle do have the capability to store vitamin A in the liver, although this supply can only last two to four months when a dietary deficiency exists. Therefore, this year in particular, cow-calf operations in the Southern Great Plains region should be diligent in making sure cows receive adequate supplemental vitamin A this winter and spring.

Where other nutrient requirements are expressed as a percent of the diet or as parts per million (ppm), vitamin requirements are generally expressed in international units (IU). Table 1 shows vitamin A requirements for different classes of beef cattle.

Most commercial feed and mineral products have historically included 100% or more of the vitamin A requirement. Recently harvested, high-quality hay may contain 50 to well beyond 100% of the vitamin A needed. However, some studies show a decline in carotene by 50% or more after seven months of storage. If you have low-quality hay or older hay, 100% supplementation is suggested. Cattle grazing wheat pasture and spring/early summer abundant immature, growing forage should not require vitamin A supplementation.

One good rule of thumb is to "keep it fresh." As mentioned previously, this applies to stored forage. Two-year-old hay will have little vitamin A potential. However, this rule also applies to free-choice mineral and concentrate feed products. Vitamin A activity can decay over time in these products. Decay will be exacerbated by exposure to heat, light, moisture and inorganic minerals.

Besides standard mineral packages and commercial concentrate feed products, vitamin A can be supplied by injectable products and liquid-drench forms. These techniques are a good way to get the cow herd caught up on vitamin A stores rapidly.

Baby calves have very little vitamin A stored in the liver at birth. Therefore, consumption of colostrum soon after birth is critical to boost availability of vitamin A during the neonatal period. For this reason, producers should make

Table 1: ***Vitamin A requirements for beef cattle***

	Growing Steers and Heifers	Stressed Steers and Heifers	Gestating Cows	Lactating Cows
Vitamin A, IU/lb of feed DM	1,000	2,250	1,300	1,800
Vitamin A, IU per day	12,500	15,000	34,000	54,000

sure cows receive adequate vitamin A well in advance of the calving season.

Vitamin A status in your cow herd is not difficult to determine. While liver tissue samples are the most sensitive, blood vitamin A activity has been determined to be an effective indicator in cattle. Many feed and veterinary diagnostic laboratories offer this service. Be sure to visit with your veterinarian and nutrition consultant to determine an effective supplementation or "herd status" survey strategy.

Western Region

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Fall-calving herds

Main Focus: getting cows bred

1. **Return inseminations.** If you are artificial inseminating (AI) breeding return heats, give a GnRH (gonadotropin-releasing hormone) injection at the time of breeding, as it has been proven to increase conception rates on repeat inseminations. You should also consider switching bulls with repeat inseminations, and breeding the females to a different sire the second time.
2. **Natural service sires.** Bulls are probably already turned out or will be shortly. If females are in pastures where they are easily observed, record natural service dates and watch for return heats in cows that have been naturally covered by bulls. If a high percentage of the females that have been naturally covered by bulls are coming back into estrus, replace the bull if that is an option.
3. **Mineral supplementation.** Mineral supplementation is important to achieve optimal reproductive performance. The breeding season is the most critical period to be certain that females are achieving adequate mineral consumption. I prefer using a combination of both injectable and consumable mineral products.
4. **Protein and energy supplementation.** It is critical both protein and energy requirements of females are being met during the breeding season. Females should be in a state of positive energy balance or gaining weight during the breeding season, as energy balance has a major influence on fertility or conception rate.
5. **Body condition is your best gauge to determine if you are meeting energy requirements.** For protein, it is best to watch fecal output. If the female's fecal output is loose and the "cow pies" flatten out on the ground, protein intake is adequate. If the fecal output looks more like a horse's fecal output, the cows are deficient in protein intake.
6. **Vaccinations.** Calves should have already received their first round of vaccinations. Producers should consult with their veterinarian in developing their vaccination protocol. I recommend calves are at least 45 to 60 days old before they receive their first round of vaccinations. This can cause a problem if you have some late clean-up sired calves. In these situations, I like to vaccinate the AI sired calves about 30 days before the cleanup-sired calves. In many operations, this practice may not be practical.
7. **Bottom-end bull calves.** Calves should be old enough by now to identify the bottom end of the bull calves. I recommend producers look at bull calves with a critical eye and a sharp knife. In most herds, I believe the bottom 20% of the bull calves should be castrated, and this should be determined based on phenotypic quality only.

Spring-calving herds

Main Focus: the calving season

1. **Calving supplies.** Supplies should be on hand, and the proper equipment should be available to assist females with problems at calving. Be sure your personnel are properly trained in the most current procedures recommended for assisting females experiencing calving difficulties.
2. **Colostrum.** In order for maximal absorption of maternal antibodies, calves should nurse within the first six hours after birth. A supply of frozen colostrum could be kept on hand, or a colostrum replacement or supplement could be used. Extra milk from a mature cow taken shortly after calving is the best source of frozen colostrum.
3. **Retained placentas.** Watch

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for retained placentas, and treat those cows promptly. If the cows have not cleaned by 24 hours, we administer a prostaglandin injection as the first treatment. If they don't clean in response to that injection, then we administer another prostaglandin injection combined with a treatment of antibiotics either given intramuscularly (IM) or mixed with sterile water and infused directly into the uterus.

4. **Body condition score.** The target level of body condition at calving is a body condition score (BCS) of 5.0 (scale = 1 to 9) for mature cows and 6.0 for 2-year-old heifers. Both protein and energy requirements need to be met in order to achieve the desired level of body condition.
5. **Bull and heifer development.** Both bulls and heifers should be performing at levels that will allow achievement of desired average yearling weights. Our target levels of performance here at the university when developing bulls and heifers from weaning to yearling are 3.0 to 3.5 pounds (lb.) per day for bulls and 1.0 to 1.5 lb. per day for heifers.
6. **Treatment protocols.** Have treatment protocols and products on hand for both scours and pneumonia in suckling calves.
7. **Selection of AI sires.** Although the breeding season is still months away, now is the time to start developing a list of potential AI sires. In my opinion, this is the single most important factor determining the success of purebred cattle operations.
8. **Development of a marketing program.** Winter is also a good time to put some serious thought into developing a creative and effective marketing program. If you do not feel comfortable in this area, there are numerous marketing consultants who can provide excellent advice in developing an effective marketing program.

Southeast Region

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At our operations and even our homes, we tend to not always have every tool we may need. It may be we need a seed drill, but it's more economical to lease one.

Still, some tools are an absolute necessity, like a pair of fencing pliers. From a management standpoint, there are tools we might be able to do without. Although, there are others we really shouldn't do without.

Here is a short list of tools every operation needs:

1. **Eyes.** Every operation needs good eyes on their herd. Health is probably the first thing that comes to mind, and rightly so. However, this also overlaps with nutrition. Being able to assess body condition is critical for ensuring acceptable fertility rates, calf colostrum and subsequent calf vigor.
2. **Tests analyses.** Feed and forage analyses are exceptionally important tools for proper herd nutrition. With these tools in your toolbox, fertility and pounds weaned per cow will be more tightly managed during drought and winter instead of being left to random chance. From calving to peak lactation, which is about 50 days, nutritional requirements will increase quickly. Peak lactation requirements are 12% crude protein (CP) and 60% TDN (energy). Cows in late lactation should be bred, but they still require 9-10% CP and 55% TDN. Even the "dry" cow should be monitored for body condition, particularly during the cold snaps to come. The dry cow is still pregnant and needs to provide essential nutrients to the calf *in utero*. This group of cows still needs at least 7% CP and 50% TDN on a dry-matter basis. Regarding baleage, high-quality baleage put up at over 60% and particularly over 65%, moisture is suspect for poor fermentation. Although the cattle will eat it, they can lose weight and precious body condition.
3. **Records.** Records are tools that are often overlooked or underappreciated. Evaluating body condition scores along with objective measurements such as scale weights brings another level of management power to understand if the herd is receiving appropriate nutrition or if there other underlying issues. Also, birthdate records can be a tool to gauge herd fertility as well as a tool for marketing. Online recordkeeping is one tool that isn't necessarily needed, but can be a big convenience particularly when multiple

people are involved on the operation.

4. **Calendar.** The calendar is a tool that can give you either peace of mind or anxiety. When used as a planning tool for herd management, it can help minimize issues. Dates such as "turn in bulls" and "remove bulls" keep the guesswork out of our day to day. Two of the biggest days on the calendar should be "breeding soundness exams" and "pregnancy check" days. Reduce risk and improve profitability by performing breeding soundness exams on your herd bulls. Finally, pregnancy-check day is the determination of whether the herd is functioning as expected and which cows are not performing.

Midwest Region

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Calving season is right around the corner, and it is time to put the tools in your toolbox for the 2023 calf crop. There are two critical elements to getting a calf off on the right foot. Colostrum intake is critical for a newborn calf because its immune system is not fully developed at birth. The second critical element is preventing scours in young calves.

Colostrum is the cow's first milk. During the final month before calving, the cow loads immunoglobulins into the first milk to be consumed after birth.

Timing of colostrum intake is essential. During the first six to 12 hours after birth, the calves have a very porous intestine. During this time, the large immunoglobulins can be absorbed out of the gut and used by the calf.

Cows with adequate body condition should produce plenty of high-quality colostrum for their newborn calves. There is some data to suggest that first-calf heifers produce lower-quality colostrum. Colostrum consumption should not worry producers unless nutrition during the final four to six weeks before birth is poor. If cow body condition has deteriorated, that would be a risk factor for below-average-quality colostrum.

The second risk factor is a calf that is not vigorous at birth. If the birth was difficult, or the weather prevented the calf from getting up and nursing quickly, it may be important to intervene with supplemental colostrum. Colostrum replacer is readily available for purchase, but is pricey. Only give it if recommended by a veterinarian or if one of the risk factors above pertains to your scenario.

Getting adequate colostrum intake does not make a calf immune from all disease challenges. Scours has long plagued young calves across the country. I encourage anyone who has dealt with scours in the past to read up on the Sandhills calving system, developed by faculty at the University of Nebraska (*https://beef.unl.edu/beefreports/symp-2007-17-xx.shtml*).

Two factors contribute to calf scours — a susceptible host (the calf), and a significant pathogen load. In essence, the Sandhills calving system rotates cows that have yet to calve onto a new pasture every 10-14 days. Older calves do not interact with newborn calves, reducing a route of disease transmission, and cows calve on "clean" pastures, limiting the number of "bugs" the newborn calves are exposed to from the environment. I believe this idea is important to Missouri cattle farms because of our winter-feeding strategies. Feeding hay in the same spot all winter long will create a mud pit that serves as a reservoir of the scours bugs.

Giving calves a leg up by taking steps to promote adequate colostrum intake will help defend a calf from disease until it has a functioning immune system. However, the pathogen load can overwhelm well-functioning immune systems. Feeding hay in the same spot and making the calves live in a mud lot potentially exposes them to significant pathogen loads. Give the Sandhills calving system a try with your next set of winter-calving cows. AJ