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Baleage, an option for backgrounding calves in the fall

Dr. Ryon Walker, Hill Farm Research Station, LSU AgCenter

In the southeast, approximately 55% of cow/calf herds calve during the spring (approximately 65% nationwide) which means over 50% of our calves are weaned in the fall. There are many ways we can market weaned calves; however, deciding on which marketing strategy is often times dependent upon several factors such as facilities, labor, and forage and feed resources. With the downward turn in the cattle market since 2015, premiums now play an important role in a marketing decision. Two years ago, it did not matter if you sold your calves at weaning or backgrounded them, all calves were worth a premium.

One of the issues that producers in the southeast face with backgrounding calves during the fall is the "fall forage gap". This forage gap (approximately 2 months; Figure 1) consist of the transition of warm-season forages going into dormancy and cool-season forage stands (planted or volunteer) that are too immature to graze. As this transition occurs, quality begins to decline in these warm-season forages and the concern with meeting the nutrient requirements for growth of a weaned calf is high. From an energy standpoint, warm-season perennial forages such as bermudagrass and bahiagrass typically range between 45 to 60% TDN (total digestible nutrients). This fall forage gap is typically filled using low- to medium-quality warm-season grass hay [7-9% crude protein (CP) and 45-60% TDN] that requires additional supplementation with concomitant increased cost of production. A growing calf after weaning needs 9.5% CP and 60-65% TDN in the diet with an intake of 2-3% of the calf's body weight to achieve targeted gains of approximately 1.5 pounds/day. Thus warm -season forages (whether standing or in round bales) as a backgrounding diet alone will typically not meet the nutrients needed for growing weaned calves.

On the other end of this fall forage gap, most cool-season annual forages are high in nutritive value and can meet or exceed the nutrient requirements for gain in a growing calf. Typical cool-season annual forages can range from 55 to 80% TDN. The problem we run into is availability of cool-season forages for grazing in early fall. This availability will depend on the planting date, forage type, planting method, and weather conditions. In northern Louisiana, annual ryegrass planted in early September in a prepared seedbed is typically not ready to graze until mid-December.

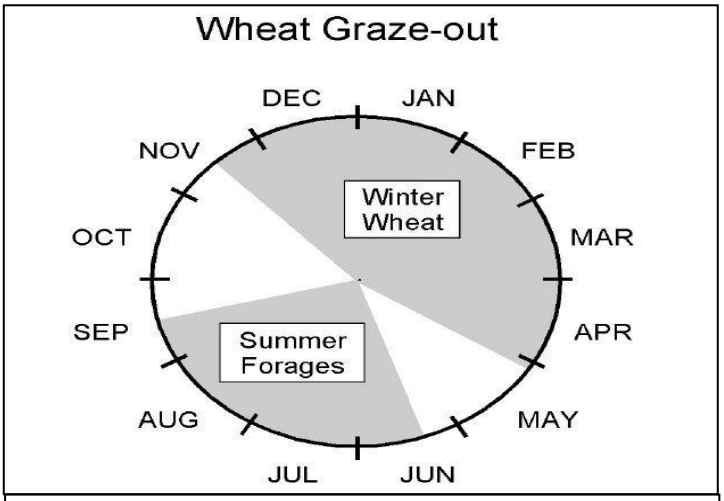

Figure 1. Primary forage systems used for grazing yearling stocker cattle in the Southern Great Plains are the wheat graze out and summer forages systems. (adapted from Northup et al., 2005)

So what are our options? The three I will focus on are bermudagrass hay, stockpiled bermudagrass, and ryegrass baleage. As we know, bermudagrass (or bahiagrass) is the most common and convenient warm-season forage we have in the southeast. With hay, there is typically a good supply and calves wean very well on bermudagrass hay. With stockpiling, planning is crucial. Pastures used for stockpiling need to be cut or grazed by the first of August and heavily fertilized until fall grazing. Because of the nutrient value of these two forage systems, supplementation is needed to get the desired gains during backgrounding. If quality of the hay is adequate (9% CP and 55% TDN), gains of 0.5 to 1.5 pounds/day can be achieved by supplementing 3 pounds/head per day with the nutritive value of a byproduct such as dried distillers grains (28% CP and 78% TDN). Obviously, expected gains will change based on supplement type, supplement and forage quality, and amount fed.

Another forage option for backgrounding calves is feeding an annual cool-season forage as baleage. Cool-season forages, such as annual ryegrass, can be harvested into baleage at a higher quality than bermudagrass hay. Baleage is an alternative conserved wet forage wrapped in a plastic wrap at 40-60% moisture content and

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Table 1. Weaned beef calf performance, nutritive value, and total tract digestibility of ryegrass baleage or dry hay fed for a 64-day fall backgrounding period.

	Animal Performance		Forage Nutrient Value					Apparent Digestibility	
	pounds of dry matter		*dry matter basis*					*Percentage of total tract*	
	ADG	Baleage	DM, %	CP, %	ADF, %	NDF, %	TDN, %	ADF, %	NDF, %
Ryegrass Hay	0.60	9.7	89.7	12.4	41.1	69.4	56.9	58	62
Ryegrass Baleage	1.0	11.8	51.2	11.9	42.0	68.3	56.2	75	75

goes through a fermentation process. If fermented under ideal moisture levels, baleage can be highly palatable compared to traditional dry hay. The curing time for forages utilized as baleage is reduced, and allows for harvesting of forages at their highest nutrient density. Over the last 4 years in several preliminary studies conducted at the Hill Farm Research Station (Homer, LA), gains of 0.4 to 0.6 pounds/day more have been achieved in backgrounded calves consuming ryegrass baleage versus bermudagrass hay, regardless if supplement was provided to both or not. In fact, one of the first studies (Martin et al., 2015) evaluated feeding ryegrass baleage, bermudagrass hay, or bermudagrass baleage to weaned Angus-cross calves for a 60-day fall backgrounding period. In this study, calves from all three forage treatments had free-choice access to a 35% (*as fed*) liquid protein supplement throughout the backgrounding period. Crude protein, fiber, and TDN values were similar across all three forage treatments. Calves consuming ryegrass baleage (ADG = 1.3 pounds) gained 0.48 and 0.6 pounds/day per head more than calves consuming bermudagrass hay (ADG = 0.82 pounds) or baleage (ADG = 0.70 pounds), respectively

The opportunity to produce high quality ryegrass baleage is there; however, many factors impact the level of quality; forage maturity at harvest, nitrogen fertilization, bale moisture at wrapping, etc. After several years of noticing a 0.4 to 0.6 pound increase in body weight/day in calves backgrounded on ryegrass baleage compared to bermudagrass hay when the nutrient content of the baleage was similar to that of the dry hay, we questioned that intakes were greater when baleage was fed, thus driving gains. In a recent study (Demeterco, et al., 2016; Table 1), we compared dry matter intake and animal gains using Angus and Brangus calves fed ryegrass baleage or ryegrass dry hay for a 64-day fall backgrounding period immediately after weaning. Calves received only hay or baleage and free-choice mineral with no supplementation. The calves fed ryegrass baleage consumed on average 11.9 pounds of dry matter and gained 1.0 pounds/head per day compared with calves fed ryegrass hay consuming 9.6 pounds of dry matter gaining 0.6 pounds/head per day. As a result, calves fed baleage consumed 18% more dry matter and yielded 40% more gain. At 48.8% moisture in the baleage and 10.3% moisture in the hay, on an *as-fed* basis that is equivalent to 23.2 pounds of baleage and 10.7 pounds of hay fed. In addition, we also learned that total tract apparent digestibility of NDF and ADF was 21 and 28% greater, respectively, for ryegrass baleage versus ryegrass hay (Ciriaco et al., 2016). Even though the baleage contained more moisture, intakes were greater for calves consuming baleage over time and the baleage was more digestible. With greater intakes, we get greater weight gain.

What our research over the last couple of years has told us is that within the first 7 days after weaning, calves will typically eat more hay than baleage with baleage intakes beginning to increase between day 7 and 10 post-weaning. This is likely due to rumen capacity and function during weaning. With the higher moisture content of baleage, rumen microbes have not adapted to this type

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Table 2. Ranking of forage systems for backgrounding based on cost and animal performance.

	Low Performance	Medium Performance	High Performance
Low Cost	Bermudagrass Hay only Stockpiled Bermudagrass	Stockpiled Bermudagrass + Supplement	
Medium Cost		Bermudagrass Hay + Supplement Baleage only	
High Cost			Baleage + Supplement

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of diet and calves would have to consume approximately 60% more baleage to equal the same amount of dry matter in hay. However, baleage cost more to produce and planning is critical for managing your cool-season grass pastures and the harvesting process. Table 2 ranks these three forages systems (with or without supplementation) based on forage cost and animal performance. Feeding baleage with a high quality supplement will give you the most gains during the backgrouding period and the biggest factor will be the quality of your baleage. Remember cost of producing high quality baleage is no different than the cost of producing poor quality baleage. Feeding baleage may not be for everyone; however, if you have the resources to make high quality baleage, it is a great alternative to dry hay or a concentrate diet for feeding backgrounded calves.

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Establishing New Pastures

Dr. Ed Twidwell, LSU AgCenter Forage Specialist

Warm-season perennial grasses such as bahiagrass, bermudagrass, and dallisgrass make up most of the acres of improved pasture in Louisiana. They also produce most of the grass hay harvested in the state. These grasses, if properly managed, are capable of remaining productive for many years after establishment, but initial establishment costs can be high. Failure to follow recommended establishment practices could add to the costs and also result in poor stands or even stand failures and the need for expensive re-establishment.

Early spring is the preferred time for establishing these warm-season perennial grasses. Dallisgrass should be planted during the March 1 to June 1 period. Germination can be slow and adequate moisture is needed for establishment of a good stand. Moisture is generally adequate during this period. Competition from summer grass-type weeds and broadleaf weeds is also less severe than with later plantings. Dallisgrass seed is expensive and difficult to obtain at the present time.

The recommended planting date for bahiagrass and bermudagrass is from March 1 through June 1. These grasses can also be planted later in the summer when adequate moisture is available.

Adequate seed or planting materials should be used to assure rapid soil coverage by plant growth of the desired grass. Seeding rates of 20 lb/acre of pure live seed of bahiagrass, or 5 lb/acre of hulled seed of common bermudagrass are adequate. The hybrid bermudagrass varieties are established with vegetative materials – either sprigs or top cuttings. Enough should be used to give 7,500 plants per acre. Fifteen to 20 bushels of Alicia, Coastal or Tifton 44 sprigs or 15 to 20 bales of Alicia top cuttings generally provide this number of plants.

For successful establishment, the seedbed should be prepared well in advance of the planned planting date. An application of 2 quarts per acre of glyphosate herbicide can be used to kill existing sod. Early cultivation allows the soil to settle before planting. The period of cultivation is an excellent time to apply any needed lime, phosphorus and potassium. Follow soil test recommendations for the exact amounts of lime and fertilizer needed to establish a good stand of grass.

If the seedbed is prepared early it should become firm by planting time. It may also crust over lightly or may contain weed seedlings. If this occurs, harrow the field lightly before planting. If the soil has not settled by planting time, run a cultipacker or roller over the field before planting.

Seed of common bermudagrass, bahiagrass or dallisgrass can be broadcast or planted with a drill. They should be covered no more than 1/2 inch deep. Running over the field with a cultipacker after planting helps to conserve moisture and firm up the seedbed.

Sprigs of hybrid bermudagrass can be planted with a grass sprigger or they can be broadcast on the surface and lightly disked into the soil. Vegetative top cuttings are usually broadcast and covered with light disking. In disking to cover vegetative materials, it is desirable to have a portion of each stem covered and a portion exposed to light.

Get Ready for Anaplasmosis Season Now

Dr. Christine Navarre, LSU AgCenter and School of Animal Sciences Veterinarian

Anaplasmosis is an economically important disease of cattle in Louisiana and many parts of the United States. Anaplasmosis is endemic in some parts of the Gulf Coast, meaning it occurs regularly and basically is "native" to the area. Increased movement of cattle due to drought, hurricanes, etc. has spread anaplasmsoss to areas previously considered free of the disease.

The implementation of the new Veterinary Feed Directive Rule (VFD) from the Food and Drug Administration in January, 2017 changed the status of the antibiotic used in feed or mineral to prevent anaplasmosis from over-the-counter to VFD. A VFD drug requires a veterinarian to prescribe use. There are requirements that must be met before a veterinarian can issue a VFD, so cattlemen should contact their veterinarian well in advance of vector season.

Transmission

Anaplasmosis is caused by the blood parasite *Anaplasma marginale.* This organism infects red blood cells, which leads to anemia ("low blood count").

Anaplasmosis is transmitted by insects or people. Horseflies and some species of ticks are the main insect vectors. Spreading by other biting flies (such as stable flies), horn flies and mosquitoes is unlikely, but possible, during severe infestations.

People can spread anaplasmosis through reuse of needles and improper cleaning of instruments during dehorning, castration or tattooing. In one study, if a needle was used on an infected cow, the next animal had approximately a 60 percent chance of getting infected if the same needle was used. The incubation period from infection to clinical signs is 3-8 weeks. A typical scenario is a herd that is vaccinated and dewormed without changing needles to begin to show signs 3-8 weeks later.

Clinical Disease

Cattle less than two years of age show no signs or only mild signs that may be confused with other diseases such as pneumonia. Cattle older than two years of age have more severe disease and are more likely to die.

Animals that become infected usually are infected for life and become carriers of the disease. These carrier animals are immune to future disease with the same strain but become a source of infection for other cattle. Outbreaks usually occur in summer and fall but can occur anytime.

Clinical Signs

Abortions may occur in females, and temporary infertility can occur in males. Animals with severe disease that live are likely to be "poor-doers" if they survive. Infected animals with less severe signs or no signs at all can have drops in milk production and infertility/embryonic death. This leads to decreased numbers of calves born and decreased weaning weights, both of which add to the financial losses due to anaplasmosis.

In endemic areas, some herds may suffer the less-noticeable problems without having obvious illnesses and deaths. This makes the disease harder to recognize, but financial losses are still severe. Additional symptoms may include:

- Fever
- Weakness
- Depressed attitude or aggression
- Decreased appetite
- Decreased milk production
- White or yellow color to the gums or vulva or yellow color to the whites of the eyes
- Death

Diagnosis

If anaplasmosis is suspected, producers should contact their veterinarians to confirm the diagnosis.

Treatment

Whether or not to treat sick cattle and others in a herd that may be incubating the disease depends on many factors and should be discussed with a veterinarian.

Prevention and Control

For herds **in endemic areas** there is constant potential for exposure, and total prevention or elimination of the disease from a herd is neither realistic nor recommended. The goal is to prevent and minimize clinical and subclinical disease and production losses.

Producers in endemic areas should assume they have carrier animals in their herds that look perfectly healthy. These carriers are protected from severe clinical disease but can be a source of infection to other cattle. The following measures can help reduce the spread of anaplasmosis:

- Do not reuse needles in animals older than 2 years of age, and clean equipment between each animal.
- Supply tetracycline products in feed or mineral supplements – particularly during the seasons when disease outbreaks are most likely (summer and fall). Make sure the supplement is labeled for the "prevention of anaplasmosis." It is illegal to use a product that is not labeled for anaplasmosis or to use a different dose from the one instructed on the product label. ***Purchase of these products now require a Veterinary Feed Directive from a veterinarian.***
- Control ticks and flies. Control of horseflies can be

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areas may help.

- Vaccination. The only vaccine available is from University Products LLC (anaplasmosis.com). This vaccine is not recommended in all herds, but when the costs of deaths, chronic "poor-doers," abortions and milk production decreases are considered, the vaccine may be cost-effective in herds in endemic areas. Vaccinate in early spring. Producers should talk to their veterinarians about cost-effectiveness of vaccination.

In non-endemic areas, prevention of infection may be possible with biosecurity measures, especially testing of any animals added to the herd with the cELISA or PCR. Since this test may miss animals in the early incubation phase, single use needles, proper cleaning of equipment and vector control are important in case a carrier slips into the herd undetected. Retesting these additions to the herd in six months to confirm their negative status also should be considered.

Introducing cattle from *nonendemic* areas to *endemic* areas should be done carefully. If possible, introduce new animals during the seasons when disease spread is less likely. Also, consider vaccination on arrival. If vaccination is not available, a veterinarian can recommend antibiotic alternatives

Feeding Does and Baby Goats

Rodney Johnson, LSU AgCenter, Associate Agent

We are well into the kidding season and trying to reach optimum milk production of our does and obtain maximum weaning weights for our babies

Feeding the lactating doe

The lactating doe has very high nutrient requirements. The nutrient requirements are 2.8 pounds of total digestible nutrients (TDN), 0.41 pounds of crude protein (CP), 7.61 grams of calcium, and 5.33 grams of phosphorus, with 4.14 pounds of dry matter intake predicted. During lactation, the doe can consume nearly enough nutrients if an abundant supply of high quality pasture is available, such as in spring or early summer. However, does will likely lose some body weight due to the high demands of peak lactation in weeks three to eight of lactation and an inability to consume an adequate quantity of feed. Kidding should take place when there is an adequate supply of high quality pasture. If there is not adequate pasture, supplemental feed will be required. Inadequate nutrition will decrease body condition, reduce milk production, reduce kid weaning weight and increase kid mortality.

If feeding bermudagrass hay and a 16 percent dairy ration, 2.6 pounds of hay and 2.0 pounds of the ration are required to fulfill requirements. However, the doe will still lose 2.0 pounds of body weight per month. Feeding a dairy ration and hay to a doe during late gestation and the lactating period will cost approximately $30 per animal. Utilizing available pasture as a feed source is a much cheaper alternative.

Kids are usually weaned at about 12 weeks of age. Milk production of the doe begins to decrease after the sixth week of lactation and is quite low by the 12th week. Nutrient requirements decline as stage of lactation advances, enabling the doe to maintain body condition or even increase it on pasture alone. Kids may be creep fed while nursing to increase growth rate and reduce nutrient demands on the doe for milk production

Creep feeding

Creep feeding is a method of providing feed for the kids only. It is accomplished by fencing around a feeder and using a creep gate that has holes about 5 inches wide by 1 foot high. These holes are small enough so that kids can enter the feeder, but adults are excluded because they are too big to go through. Creep feeding will provide extra growth for the kids and train them to eat feed, facilitating weaning. A commercial creep feed with at least 16 percent crude protein should be used. About 8 pounds of feed are needed to produce 1 pound of animal gain. The more rapid growth from creep feeding may be beneficial for producing show prospects.

An alternative to grain-based creep feeds that is used in the beef cattle industry is to creep graze calves, using a creep gate that allows calves access to ungrazed, high quality pasture. This method may have application for goats, using high quality pastures (crabgrass or sudangrass that is planted for the kids). In rotational grazing of cattle, the calves are often allowed to creep graze the next pasture before cows so that they have relatively high nutrient intake. Those pastures often have fewer parasites and disease organisms because of the time since last grazing.

Replacement Heifers: an Important Component of Beef Cattle Herds

Jason Holmes, LSU AgCenter Extension Agent

Raising heifers for replacements in your own herd or for sale to other producers in an efficient manner requires attention to detail. The success of your operation, or the demand for your heifers by others, depends heavily on how you choose to develop that heifer over the next two years. Considerations should include goals planned for the herd, the management program now in place, marketing options, maternal versus terminal genetics, disposition, etc. A replacement heifer represents a sizable financial investment. If the cows being replaced calved every year at about the same time and milked well enough to produce a heavy, quality calf that fit several options for marketing, no less should be expected of their replacements.

When you're thinking about specifications for a replacement heifer, fertility (reproductive ability) must be a major consideration. Fertility is a complex trait, composed of many sub-traits affected by both genetic and environmental influences. From an economic standpoint, a high fertility level in a herd is the most important objective. Early puberty, early breeding (early calving), calving ease and consistent rebreeding are the major components of desirable female fertility. The other attributes a cow may possess are simply refinements of an already acceptable product.

Replacement heifers are available from two sources. They can be produced from the herd they are intended to produce in (raised by a producer to keep) or purchased. There are pros and cons for each method, and significant economic differences can exist.

The advantages of raising replacement heifers start with the ability to genetically design the females by selection of the bull that will be their sire. Bulls with desirable EPD's (Expected Progeny Difference) for maternal traits can be bred to selected cows (those with records of early and continuous calving) to produce potential replacements. Within herd production also provides accurate birth dates, growth records and known health management. Cash outlay is over a two-year period, and obvious failures (unsuitable as replacements) can be sold at any time to provide income. Admittedly, producing replacements is probably more economical in large herds than in small herds because of the advantage of sheer numbers of cattle.

The disadvantages of raising replacements center on management requirements. Pasture separate from that accessible to mature cows is required, therefore reducing mature cow herd numbers. A separate bull or bull battery must be maintained for use on heifers (wise use of artificial insemination could facilitate this) to alleviate difficulty at first calving. Keeping bulls away from cycling heifers until the proper time is a problem in many cases, especially in smaller herds. If heifers are bred to produce a calf at 2 years of age, the first income they generate comes only after 2 ½ years, a definite drawback in herds under financial stress.

The greatest advantage of buying replacements, assuming they are available, is being able to be selective. Successfully locating heifers of desirable breeds or types and known pregnancy status can often complement existing herds. If they are open, heifers can be bred to minimize calving problems or produce a calf of known genetic composition. However, payback from bred heifers comes sooner than from open heifers. The biggest disadvantage of depending on bought heifers is the question of consistent availability and their compatibility with planned herd management. It is sometimes difficult to find heifers of the needed breed composition, bred to calve in the desired calving season, and produce a calf of the desired genetic makeup.

In summarizing about sources, it seems that producing heifers for replacement is perhaps best suited for producers with intensive management programs in place; buying heifers or young cows with their first calf is best suited for producers with less intensive management specifications.

Beef Cattle Temperament Important in Your Operation?

Dr. Tim Page, LSU AgCenter, Extension Specialist

Is beef cattle disposition and temperament important to a successful operation? Research and my lifetime of cattle experiences have proven to me that docile cattle are more fertile, have higher average daily gains, are more feed efficient, healthier, and will produce carcasses with higher quality and yield grades.

How many of you have experienced cattle that are flighty, high headed, hard to pen, and just downright mean and dangerous to other cattle and people? Most of us have at some time or another. In today's industry there are several tools that we can use to determine which cattle possess good temperament versus cattle with bad temperament. Research and producers have long used chute exit velocity, chute temperament, and visual observance when determining cattle disposition. Newer research is using EPD disposition and even location of whorls (cowlicks) to help determine cattle temperament. The higher the EPD disposition number the better. Higher cortisol levels also indicate poor disposition. Believe it or not, research is now showing that cattle with whorls lower on the face will have calmer dispositions. Cattle with whorls above the eyes will usually have worse dispositions than cattle that have whorls between the eyes or below the eyes.

That is probably enough about whorls, cowlicks and such. I help many producers select replacement heifers. I don't care how good a heifer is (scan data and visual score), if they act up in the chute, she is gone and she can be someone else's problem. If a cow is ill tempered, her calf will be too and she needs to be culled. Temperament is fairly high in terms of heritability (40%). I do not want heifers/cows to be perpetuating bad disposition in my herd.

One recent study (over 47,000 feedlot cattle) were evaluated for average daily gain, feed conversion, morbidity, mortality, quality grade and tenderness. This study showed that docility is worth over $62 per head. That is a lot of money per head. That would mean that 75 head of calves in one pen in the feedlot might be worth $5,000 more just because of being docile. Because of increased profits, cattle safety, and worker safety, we should be advising beef cattle producers that selection for disposition and temperament should be high on their list of keeping and culling.

Feeding the Malnourished Horse

Dr. Neely Walker, Equine Specialist, LSU School of Animal Sciences

Weight loss or reduction in appropriate body condition can be linked to a number of factors most commonly including, age, disease, and lack of proper nutrition. Regardless of the reason for the reduction in body condition, care must be taken to create a plan to return the horse to a more "ideal" nutritional plane. This plan should include veterinary examination to ensure that proper organ function is in place and that the horse is not suffering from a condition or illness that would cause the weight loss or reduction in appetite.

In order to access a horse's current condition, you must first understand the Henneke Body Condition Scoring system. This system relates the amount of excess energy reserves or fat cover on a horse's body, and utilizes a scoring system of 1-9. A "moderate" or a horse with ideal fat stores will have a score of 5. A horse with a score of 5 will have a level back, ribs that cannot be visually distinguished but can be felt easily, fat around the tailhead, with withers that appear rounded with a shoulder and neck that blend smoothly into the body. The Louisiana Department of Agriculture and Forestry's minimum care standards for horses require that a horse has a minimum body condition score of a 3 to prevent cruelty or neglect charges. A horse with a body condition score of 3 is considered "thin" and only has built up fat halfway on the spine, slight fat covering over the ribs, however the spine and ribs are easily visualized, has a prominent tailhead, and the bones of the pelvis, hip, and withers are accentuated. A horse can also be considered "starved" if it has lost more than 15% of its body weight in 60 days or less.

A normal horse with adequate nutritional support will utilize fat and carbohydrate stores as an energy source to fuel normal physiologic activities which are then replenished by nutrients in their diet. When a horse does not have access to or cannot consume enough nutrients, the body begins to break down proteins, from tissues like muscle and vital organs to provide the energy it needs to maintain the basic daily functions. If this process continues for an extended period of time, irreversible damage can be done to major organ systems, which decreases the overall chance that the animal will return to a normal body condition or survive.

Once an animal reaches a malnourished state, it can be a long difficult process for them to return to a normal nutritional plane. It is important to work with a veterinarian to ensure proper feeding methods and products are being used. It is very easy for a malnourished animal to experience "refeeding syndrome" a condition that occurs when horses are introduced to feed to quickly which will result in a surge of insulin secretion and a rapid uptake of glucose. The rapid increase of glucose will cause increased mineral uptake into the cells and can cause heart, liver, kidney, respiratory failure or death. Refeeding syndrome can occur in 3-10 days following an increase in calories, therefore it is important to reintroduce feed slowly to a malnourished horse to prevent additional health issues.

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Research has shown that high forage diets are the most successful at returning horses to an appropriate body condition score following malnutrition while preventing the occurrence of refeeding syndrome. Alfalfa hay has been shown to be the best option to increase body condition score in a malnourished horse due to its high protein, low carbohydrate composition. This reduces the potential spike in insulin and the chance of refeeding syndrome from occurring. The suggested alfalfa feeding regime is listed below:

- Days 1-3: 1 lb of alfalfa hay every 4 hours
- Days 4-14: 4 lbs of alfalfa hay every 8 hours
- After 2 weeks, horses can be fed as much hay as they will eat.

Even though research has shown that alfalfa hay is the best option, its expense and availability may make it an unviable option. In that case, grass hay can be substituted; however grain or concentrated pellets should be avoided completely until the horse has returned to a normal body condition score. The suggested grass hay feeding regime is listed below:

A horse with a BCS lower than 3 may require extended period of time for recovery.

- Days 1-3: 2 lbs of grass hay every 4 hours
- Days 4-14: Slowly increase grass hay until you can feed 8 lbs of grass hay 3 times a day
- After 2 weeks, horses can be fed as much grass hay as they will eat.

While there are appropriate protocols to help a malnourished horse return to a normal body condition, it is a long, slow process. Typically 3-5 months up to a year may be needed to see the horse return to a healthy status. It is extremely important that a malnourished horse be examined by a veterinarian on a regular basis so that appropriate recommendations for treatment of illness, disease, parasites, vaccinations and dental condition can be addressed when the animal is in good enough condition to reduce overall stress. Keep in mind that despite an owner's willingness to continue extended care of a malnourished horse, in some instances humane euthanasia may still need to be considered, due to lack of improvement or other complications due to the reduced health status. Maintaining adequate nutritional status and care for your horse is the best preventative for the dangers associated with a low body condition. If you suspect your horse is malnourished please contact your local veterinarian immediately.

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What is the optimal pregnancy rate in dairy herds?

Dr. Charles Hutchinson, Southeast Research Station Director

One of the newest benchmarks to evaluate reproductive efficiency in dairy herds is the average 21 day pregnancy rate for the herd during the breeding season. During the breeding season every 21 day increment has a pregnancy rate calculation. Pregnancy rate is calculated by taking the number of animals diagnosed pregnant from a breeding during the 21 day period divided by the number of animals eligible to be bred during the 21 day period regardless if the animal was inseminated or not. Currently, a 20% to 22% pregnancy rate is considered the benchmark to strive for in dairy herds. However, some herds have a pregnancy rate of 30% or higher. What should be the optimal pregnancy rate in a dairy herd? Dr. Albert De Vries, University of Florida dairy specialist, recently conducted a review of the published literature showing that greater pregnancy rates have been associated with greater profitability, but profits are less when pregnancy rates are already high.

Therefore, a rate of diminishing returns probably exists as pregnancy rates and reproductive efficiency climbs to higher and higher levels, especially if higher pregnancy rates are not part of a well-thought out herd management plan. Also, improving the pregnancy rate in a herd usually involves more cost.

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In a simulation De Vries ran, moving from a 23% pregnancy rate up to 26% would generate about $35 more profit per milking cow. So if it costs less than $35 to increase the pregnancy rate by three percentage points, the difference would be a net gain. But if it costs more than $35, there would be a net loss.

Dr. De Vries conducted an analysis of 7,032 DHIA herds with records processed by Dairy Records Management System in Raleigh, N.C. The average herd size was 239 cows, with an average pregnancy rate of 19% and a herd average of 23,239 lb. Eleven percent of the herds, representing 21% of the cows in the study, had a pregnancy rate between 28 and 39%. These farms averaged 425 cows and had herd averages of nearly 26,000 lb.

"Herds with greater pregnancy rates also had shorter days in milk, longer voluntary wait periods, but shorter days to first service, greater service rates, fewer days open, shorter actual calving intervals and more calves per present cow," says De Vries. Thus, the major factor that drives profitability in these herds is shorter days in milk, which in turn leads to greater feed efficiency and therefore greater income over feed cost.

De Vries also looked at culling rates between average and high pregnancy rate herds and noticed very little difference with the average cull rate being about 37%. So it would appear that the average pregnancy rate herds weren't culling fewer cows because they had reproductive failures and fewer heifers for replacements and herds with the higher pregnancy rates were not culling more because they had potentially a surplus of heifers as replacements.

Herds with high pregnancy rates should have a sound management plan on how to deal with the potential for a surplus of heifer calves. One option would be to raise all the heifer calves and increase the culling rate in the herd. This would improve the genetic merit in the herd but could lower over-all milk production in the herd since first calf heifers normally do not produce the volume of milk as compared to more mature cows. Cull rates could be kept the same and some of the surplus heifers could be sold using genomic testing to help decide which heifers to keep.

The bottom line is there might not be one optimal pregnancy rate for all dairy herds. A well thought-out management plan on how to deal with surplus heifers would help determine the optimal pregnancy rate in a herd.

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