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Inside:

Managing Your Riparian Zones

Dr. Dirk Philipp, Assistant Professor - Forages

One of the most beautiful aspects of the Arkansas landscape is the vast abundance of waterways and the lush riparian areas that surround them. These areas are cherished by the many visitors to the "Natural State," and even more so by Arkansas producers and cattlemen who appreciate the cooling shade riparian zones provide during the intense summer heat along with the habitat for wildlife that makes for a great hunting season during fall and winter.

Now is a good time to reassess your riparian zone management, plan improvements and perhaps assign new areas for establishing vegetation or structural devices for streambank protection. Keeping good records is important, and for riparian zone management, it might be a good idea to draw a simple map of your streams to keep track of problems and improvements over the years. Whenever you spot eroded stream banks, washed-out cattle crossings or missing understory close to the stream, then these are the areas you might target for improvement.

Low-impact cattle crossings are relatively simple to install. Use a roughly 8-foot wide concrete slab as the crossing base, and surround the slab up- and downstream with large gravel or rocks that discourage the cattle from wandering into the streambed. These structures will also reduce the transport of sediment and debris that will be trapped among the gravel and rocks. Alternatively, you can use gravel instead of concrete or even stabilize the gravel with an underlying geoweb. Improved crossings should be located where crossings already exist and where crossings facilitate movement of cattle between pastures.

Check surrounding areas next to the crossings for damage. Often, cattle do not just walk through the streams but also scrub their heads on the banks, making them even steeper and more erodible. If heavily eroded banks are present, then temporary, or for some sections, permanent exclusion may be warranted. One strategy is one-sided exclusion of the stream with a temporary fence. This will allow cattle access on one side, but animals are not able to walk through the entire stream. This option requires frequent herd rotation to avoid overuse of one or the other side of the streambank. An extended version of this practice is two-sided fencing and is recommended whenever streambank degradation has reached a level at which only exclusion will provide sufficient soil protection. In this case, animals can still be given access during certain times of the year to utilize forage inside the fenced area. We just started a new project at the Southeast Research and Extension Center in Monticello where these strategies are being demonstrated.

Establishing a fully functional riparian zone takes a lot of effort, but appropriate grazing management strategies can greatly reduce negative impacts. Generally, grazing practices that diminish plant vigor and accelerate soil erosion should be avoided. Grazing may occur whenever conditions are appropriate for minimized environmental impact, such as low soil moisture content of streambanks, forage canopy height no less than 4 inches and relatively cool air temperatures so that cattle don't feel encouraged to walk into the streambed. Grazing methods utilized should be planned with the objective of reducing

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environmental impacts. Try to optimize stocking rate and density so that forage can be removed with little disturbance of wildlife habitat or streambank structure. Dormancy of native warm-season species during winter gives the chance of grazing cool-season grasses, such as fescue, in riparian zones. Nevertheless, care should be taken of the structural integrity of streambanks during times when streambanks are soaked with water, as is currently the case due to abundant rainfall during the past weeks and months.

Shorter days during the winter mean you have opportunity to go online and check out new or current state or federal cost-share programs for protection of riparian zones or new findings for managing these. Extension personnel are ready to help in developing a good plan for your riparian zone and grazing management. If livestock is managed properly, the integrity of stream corridors on your property is maintained with positive outcomes for both the economy and the environment.

Recent Research Shows Effectiveness of Commonly Used Dewormers

Jeremy Powell, Associate Professor and Veterinarian

Many factors affect the severity of parasite infections in cattle. However, there is little doubt that intestinal parasite infections cost producers money. A recent study from Iowa State University[1] indicated that parasite control or a lack thereof has the greatest effect on breakeven prices in cow herds. These costs are typically from subtle losses that continuously rob our animals of optimum performance each day. Worms cause decreased feed intake; lowered weight gain; reduced body condition, potentially leading to lowered reproductive performance; and decreased milk production, causing reduced weaning weights. Intestinal parasite infections also cause intestinal tissue damage and blood loss, leading to poor nutrient absorption, lowered feed conversion and reduced immune competence. Researchers have shown that by providing parasite control, producers can improve breakevens by $201 per head[1].

A 2008 study conducted at the University of Arkansas[2] compared the effectiveness of four commonly used dewormers in a fecal egg count reduction test as well as a control trial. Fifty head of stocker calves were allocated into groups of 10 animals and assigned the following treatments: Cydectin® injectable, Ivomec® injectable, Synanthic® drench, Safeguard® drench and an untreated control. Throughout the study, cattle were maintained in concrete-floored pens to inhibit parasite reinfection. Fecal egg counts were performed on the day of treatment (day 0) as well as on days 1, 2, 3, 4, 5, 7, 11, 14, 18, 25, 28 and 32 of the study. From day 35 to 39, all animals were sacrificed and their parasite burdens were documented.

Figure 1. Fecal egg count reduction percentages specific to post-treatment day

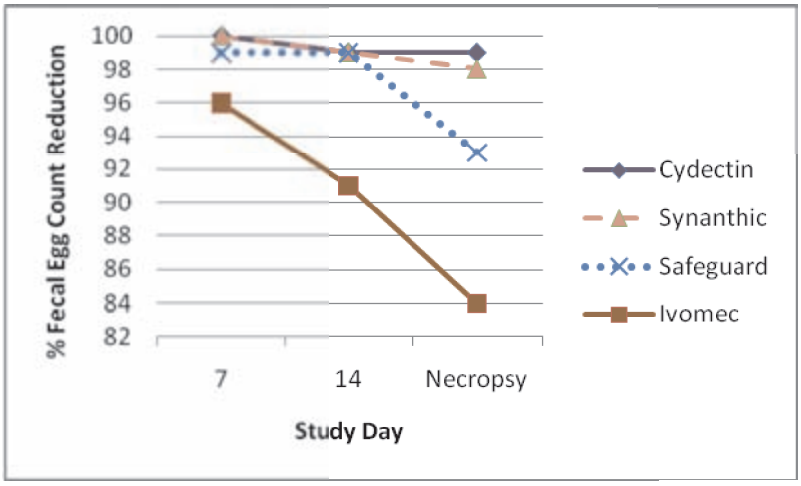


Figure 1 indicates the fecal egg count reduction percentages specific to post-treatment day. Cydectin injectable maintained the highest fecal egg count reduction percentage throughout the study period. This was followed by Synanthic, Safeguard and Ivomec, respectively. For study days 2 through 14, fecal egg count reduction percentage was greater than 90% for all products. Up until necropsy, these percentages continued to be greater than 90% for all products with the exception of Ivomec.

With the worm counts conducted at necropsy, the percent efficacy for each product was determined (Table 1). Results indicated that all of the parasite populations were removed by > 96% by Cydectin (CYD). Synanthic (SYN) removed all populations of parasites at > 90% with the exception of *O. osteragi*

Table 1. Percent efficacies by treatment determined at necropsy

Nematode	Dewormer Product			
	CYD	SYN	SAF	IVO
O. ostertagi				
Adult	99.9	89.9	72.5	98.3
EL_4	99.6	70.2	0	91.1
LL_4	97.6	48.1	21.9	81.9
H. placei, Adult	100	97.8	100	97.8
T. axei, Adult	100	99.5	100	99.8
Cooperia, Adult				
oncophora/surnabada	96.3	99.1	99.8	77.4
punctata	98.1	97.9	99	84.8
Total *Cooperia*	97.3	99	99.5	84

adults, EL_4 and LL_4 (89.9, 70.2, and 48.1%, respectively). Safegaurd (SAF) removed all populations of parasites at > 90% with the exception of *O. osteragi* adults, EL_4 and LL_4 (72.5, 0, and 21.9%, respectively). Ivomec (IVO) removed all populations of parasites at > 90% with the exception of *O. osteragi* LL_4 (81.9%), *C. oncophora/surnabada* (77.4%) and *C. punctata* (84.8%).

This study demonstrated varied degrees of parasite sensitivity to the products that were used. Cydectin was effective against all populations of parasites, Synanthic and Safegaurd were not effective against *O. ostertagi*, while Ivomec was not effective against *Cooperia* populations as well as developing *O. ostertagi*.

Internal parasites are an ever-present factor in livestock operations. It is easy to forget their negative effects because they are "out of sight and out of mind" most of the time. However, utilizing proper deworming practices on your farm will increase overall productivity and efficiency. For more information about improving the management of your herd, contact your county Extension office.

[1]Lawrence J.D., and M.A. Ibarburu. Economic analysis of pharmaceutical technologies in modern beef production in a bioeconomy era. 2009. Iowa State University.

[2]Yazwinski, T.A., C.A. Tucker, J. Powell, J. Reynolds, P. Hornsby and Z. Johnson. Fecal egg count reduction and control trial determinations of anthelmintic efficacies for several parasiticides utilizing a single set of naturally infected calves. 2009. *Veterinary Parasitology* 164:232-241.

Watch for Cold Stress in Cattle

Dr. Tom Troxel, Professor

Wintertime brings many challenges for beef cattle producers. Factors that create stress during the winter are cold, wind, snow, ice, rain and mud. The primary factor affecting beef cattle is temperature. All these factors, however, alter the maintenance energy requirement and intake of beef cattle. Maintenance requirements can be defined as the nutrients required for keeping a beef cow so that body condition is neither gained nor lost.

Research reports and producers' experiences tell us more feed is consumed during cold weather and especially cold, wet weather (Table 1). Another very important nutrient oftentimes overlooked in winter is water. If water is not supplied, cattle will reduce feed intake which will compound body condition loss.

Table 1. Daily dry matter intake of beef cows with respect to temperature

Temperature (°F)	Dry Matter Intake
< 5	Intake stimulated 8% to 25%[a]
5 to 23	Intake stimulated 5% to 10%
23 to 41	Intake stimulated 3% to 8%
41 to 59	Intake stimulated 2% to 5%
59 to 77	Normal intake
77 to 95	Intake depressed 3% to 10%
> 95	Marked intake especially with high humidity

[a]Intakes during extreme cold or during blizzards and storms may be temporarily depressed.

The metabolic response to the stimulus of cold involves practically all the systems of the body. The striated muscles shiver, the heart beats faster, breathing becomes deeper, urine flow is increased and the sympathetic and pituitary-controlled systems are activated so as to elevate biological oxidations (energy expenditure or heat production) in all tissues. The result is an increase in the cow's requirements for energy.

There is a range of temperature where cattle are neither too hot nor too cold and their performance is optimal (approximately 59 to 77 degrees F). This temperature range is called the thermoneutral zone. It is the temperature range where the fewest nutrients are needed to maintain bodily functions.

Snow is preferred to a cold rain. When cattle get wet, "air insulation" is lost versus those that are out in the snow. The air pockets between hair fibers are a source of insulation. This insulation is matted down in a cold rain, and thus the air insulation is lost.

From several studies, it is estimated that for every one degree below the critical temperature, a cow's energy requirement (TDN) increases 1%. It is also estimated that for every ten degrees below the critical temperature, the digestibility of the ration decreases by 1%. This means that when the temperature drops below the critical temperature, the cattle need to be better fed. It may be that more or higher-quality hay needs to be provided.

Besides cold weather affecting cattle performance, producers have another thing to consider during winter – mud. It is less clear what effect mud has on a cow's energy requirements, but it is estimated that it can increase the maintenance requirement from 7% to 30%. If cattle have to deal with mud, then their ration should also be improved.

Another tool producers have to help determine if what they are feeding is adequate, besides forage testing, is body condition scoring. In the last trimester of pregnancy, a cow should have a score of 5, 6 or 7 on a 1-9 scale. If a cow is going down in BCS, then the ration is inadequate and should be improved.

Another concern for producers over the winter period is for newborn calves. Many producers schedule calving in the last winter months, so it is very important the newborn calves don't get chilled or they could die. Move chilled calves out of the weather, rub the animals down with a towel to stimulate circulation and use a heat lamp, if necessary, to help the calves recover.

For more information about cattle production, contact your county Extension agent or visit Extension's Web site at **www.uaex.edu**. The Cooperative Extension Service is part of the U of A Division of Agriculture.

Body Condition Scoring for the Spring Calving Season

Bryan Kutz, Program Associate - Livestock

As the spring calving season begins, efficiency comes to mind. Stress at calving, ample lactation and reproductive performance are key factors that can affect cow-herd efficiency and ultimately affect profitable production. Body condition scoring at calving is an evaluation tool that can be utilized by farmers and ranchers to assess the level of fat reserves of cows.

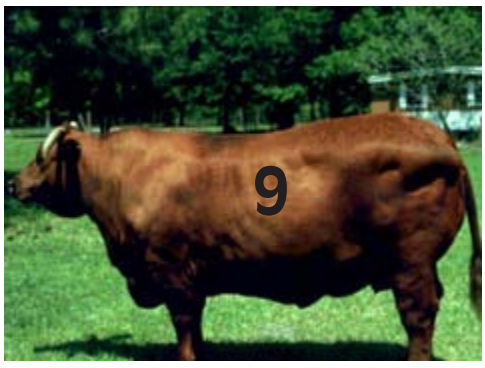
The processes of fetal development, delivering a calf, milk production and repair of the reproductive tract are all stresses that require large quantities of energy to enable cows to be rebred within 60-85 days. Additionally, the environmental stresses on spring-calving cows may require even more energy intake. This source of energy needs to come from excess fat reserves in the cow before calving.

It is much easier to increase condition in cows before rather than after they calve. High nutrition after calving is directed first toward milk production. Cows need to be at a condition where extra energy reserves can be used to help overcome the stress at calving and aid in reproductive tract repair. Feeding cows to gain condition after calving leads to improved milk production and has little effect on increasing body condition.

Studies have shown that cows in good to moderate (5-7 BCS) condition will tend to have a calving to first estrus interval that could be up to 30 days shorter than those that are in thin condition (1-4) at calving. Animals with a low BCS will tend to become far too thin. This results in a low conception rate and an uneconomically long calving to breeding interval. At the same time, cows that become excessively fat also have production problems. These cows will likely have more incidence of dystocia and milk production problems because of the additional fat deposits.

The idea of Body Condition Scoring (BCS) is to obtain a simple and reliable measure of the level of fat reserves that will be helpful as the cow progresses through gestation, parturition and rebreeding. When used correctly, this information can help you make management decisions, such as which cows should be culled or deciding among different feed regimens or how best to utilize available forage resources. These decisions all play a big role in making your cow herd efficient and profitable.

Description of body condition scores		
Condition	**BCS**	**Description**
Thin	1	Severely emaciated. All ribs and bone structure easily visible and physically weak.
	2	Emaciated, similar to 1 above but not weakened. Little visible muscle tissue.
	3	Very thin, no fat on ribs or brisket, and some muscle still visible. Backbone easily visible.
Borderline	4	Thin, with ribs easily visible but shoulders and hindquarters still showing fair muscling. Backbone visible.
Optimum	5	Moderate to thin. Last two or three ribs can be seen. Little evidence of fat in brisket, over ribs or around tailhead.
	6	Good smooth appearance throughout. Some fat deposition in brisket and over tailhead. Ribs covered and back appears rounded.
	7	Very good flesh, brisket full, tailhead shows pockets of fat, and back appears square due to fat. Ribs very smooth.
Fat	8	Obese, back very square, brisket distended, heavy fat pockets around tailhead, and cow has square appearance due to excessive fat. Neck thick and short.
	9	Rarely seen. Very obese. Description of 8 taken to greater extremes. Heavy deposition of udder fat.



An Introduction to Feeding Small Ruminants

Steven M. Jones, Associate Professor - Livestock

Nutrition exerts influence on flock reproduction, milk production and growth. Late-gestation and lactation are the most critical periods for ewe and doe nutrition, with lactation placing the highest nutritional demands on ewes/does. Nutrition level determines growth rate in lambs and kids. Animals receiving inadequate diets are more prone to disease and will fail to reach their genetic potential.

Many factors affect the nutritional requirements of small ruminants: maintenance, growth, pregnancy, lactation, fiber production, activity and environment. As a general rule of thumb, sheep and goats will consume 2 to 4 percent of their body weight on a dry matter basis in feed. Maintenance requirements increase as the level of the animals' activity increases. Environmental conditions also affect maintenance requirements. In cold and severe weather, sheep and goats require more feed to maintain body heat. The stresses of pregnancy, lactation and growth further increase nutrient requirements.

Pasture, Forbs and Browse

Pastures/forages are the cheapest feed sources for both sheep and goat production. Therefore, we should use them to the fullest extent. Establish a grazing system using both cool-season and warm-season species. For winter feeding, planting small grains (wheat, rye, oats and ryegrass) in combination with clovers reduces feed cost and the need for stored forage. As pasture plants mature, palatability and digestibility decline. Therefore, it is important to rotate pastures to keep plants in a vegetative state. During the early part of the grazing season, browse (woody plants, vines and brush) and forbs (weeds) tend to be higher in protein and energy than ordinary pasture. Sheep are excellent weed eaters. Goats are natural browsers and have the unique ability to select plants when they are at their most nutritious state.

Hay

Hay is the primary source of nutrients for small ruminants during the winter or non-grazing season. Hay varies tremendously in quality, and the only way to know the nutritional content is to have the hay analyzed by a forage testing laboratory. Legume hays such as alfalfa, clover or lespedeza tend to be higher in protein, vitamins and minerals (especially calcium) than grass hays. The energy as well as protein content of hay depend upon the maturity of the forage when it was harvested. Proper curing and storage is also necessary to maintain the nutritional quality of hay.

Concentrates

Concentrates are fed to supply animals' energy and/or protein requirements that are not being met by the forage source. Energy feeds include the cereal grains corn, barley, wheat, oats and milo. It is not necessary to process grains for sheep and goats unless the animals are less than six weeks of age and lack a functioning rumen. One of the problems with feeding a lot of cereal grains is that they are high in phosphorus content but low in calcium. Feeding a diet high in phosphorus and low in calcium can cause urinary calculi (kidney stones) in wethers and intact males. Inadequate calcium can lead to milk fever (hypocalcemia) in pregnant or lactating ewes/does. Protein supplements include soybean meal, cottonseed meal and fish meal. Ruminant-derived meat and bone meal cannot (by law) be fed to other ruminants, including sheep and goats. By-product feeds can be incorporated into small ruminant diets if they are cost effective. Due to its copper content, it is not recommended that sheep be fed broiler litter for sustained periods of time.

Vitamins and Minerals

The most important minerals required by small ruminants are salt, calcium and phosphorus. The ratio of calcium to phosphorus should be kept around 2:1 to prevent urinary calculi. Vitamins are needed in small amounts. Small ruminants require vitamins A, D and E, whereas vitamin K and all the B vitamins are manufactured in the rumen. A free choice salt-mineral mix should be made available to small ruminants at all times. Either a loose mineral or mineral block may be offered.

EPDs Are Excellent Selection Tools for Meeting New Goals

Dr. Brett Barham, Assistant Professor - Breeding and Genetics

All producers are working to find ways to stay profitable in these challenging economic times. One way to stay profitable is to produce the most pounds of calf possible and to do so at a low cost. Increasing weaning or yearling weights may seem like a long-term goal, but in reality, results can be seen in just one breeding season. The key to success lies in keeping efficient cows that have the genetic potential to wean large calves and to breed them to bulls that also have the potential to do the same. The best tool producers have to make progress in selection for growth efficiency is EPDs, or Expected Progeny Differences.

EPDs are the difference in performance (measured in pounds, percent, inches, etc.) expected in progeny or offspring of individual sires. Calf weaning weight is greatly influenced by genetic potential for growth.

A study conducted at Louisiana State University several years ago looked at maternal and reproductive performances of crossbred cows over five years. Breed types of the cows used in this study were representative of the breeds that exist in commercial cow herds in the Southeast. Cows ranging in age from 4 to 10 years were impregnated by artificial insemination (AI) to Simmental sires that varied by 20.4 pounds in weaning weight EPDs. Sires included four moderate (MOD) bulls with an average weaning weight EPD of 21.4 pounds and three high (HIGH) bulls with an average weaning weight EPD of 41.8 pounds. All bulls

used in this study had high accuracies (greater than 85%) for weaning weight EPDs, indicating that EPD values would be expected to be fairly reliable. Once randomly assigned, considering cow breed type, cow age, calving date and calf sex, cows were synchronized for estrus and inseminated.

A total of 120 AI-sired calves were born and survived to weaning. Average calf age at weaning was 229 days. Cows were weighed, body conditions were scored (on a 1 to 9 scale) and pregnancy status was determined at weaning. Cows were also weighed and body condition scored at the beginning of the breeding season. Pregnancy rates of cows were evaluated during the breeding season while nursing MOD- or HIGH-growth calves and also the subsequent breeding season after weaning MOD- or HIGH-growth calves.

There was no occurrence of calving difficulty for all 120 calvings. Calf birth date, birth weight and weaning hip height were numerically larger for the HIGH-growth calves but were not statistically different. Calves sired by HIGH-growth bulls were statistically heavier than calves sired by MOD-growth bulls for actual weaning weight and adjusted 205-day weaning weight. The expected difference in weaning weights between calves from MOD and HIGH sires averaged 20.4 pounds based on weaning weight EPD information. The realized weaning weight difference between calves sired by MOD- and HIGH-growth bulls averaged 28 pounds, indicating that EPDs are fairly reliable.

Cow body weight and body condition scores at weaning and at subsequent breeding were similar after nursing MOD- or HIGH-growth calves. Cow body weights and body condition scores were numerically lower for the cows raising HIGH-growth calves but were not statistically different. It is important to note that average or adequate body condition for a mature cow is 5, and body condition scores were above this threshold regardless of type of calf raised.

Pregnancy rates were similar for cows raising MOD- or HIGH-growth calves, both while nursing calves and after weaning during the subsequent breeding season. Numerous studies have demonstrated that for acceptable pregnancy rates to be achieved, it is important that cows have at least a moderate degree of body condition (body condition score 5 or 6) at initiation of the breeding. Thus, even though differences in weaning productivity were created through sire selection, adequate body condition was maintained. As a result, cows raising either MOD- or HIGH-growth calves had similar and highly acceptable pregnancy rates.

The mating by artificial insemination of cows to bulls with weaning weight EPDs that differed by 20 pounds resulted in actual calf weaning weight differences of 28 pounds. This indicates that EPDs are fairly reliable. The use of sires with high weaning weight EPDs did not result in increased calving difficulty, did not lower cow body condition and, lastly, did not adversely affect subsequent reproductive performance of the cow herd.

This study shows that EPDs really do work as advertised. While the concept of how an EPD value is calculated is very complicated, the value to producers is undisputed. To get more information on EPDs or bull selection, please contact your local county Extension office.