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Livestock News

Jacob R. Segers, Ph.D. – Editor

Happy Holidays!

Greetings from the Department of Animal and Dairy Science at UGA,

It is that time of year again. Harvest has mostly come to close for most crops, cattlemen are in the midst of breeding season and at UGA we are rounding out yet another busy year. Students have completed finals and have left to be home for the holidays. I hope you all have an opportunity to spend time with those you love this Christmas season. Christmas is a time when we often find ourselves looking back on the year and looking forward to the year to come. I am extremely eager to begin 2016. We will be back to full staff in the beef cattle research and extension group on the Tifton campus and are looking forward to expanding our research program and mentoring graduate students. There are still a lot of new and experienced agents across the state that are hungry for programming in Animal Science. So, one can't help but be optimistic looking forward. Needless to say, I am excited for the coming year and wish your and your families the happiest and most prosperous of New Years.

As always, I am thankful to work with Georgia's agricultural industry, and wish you every success in all that you do. Warmest regards Merry Christmas

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How to Improve Forage Quality In Late Winter and Early Spring

By: Wes Smith, CEC, Upson, Pike and Lamar Counties

What can I do to make my pasture better for my cow herd? This is one of those questions that most of us hear at one time or another. If you didn't get the chance to plant winter grazing, you may decide you need to gamble and plant either oats or ryegrass in early to mid-February depending on where you are in the state. Earlier in the south, later the further north you are. Just remember that you are several months past our normal plant date, but this may help to reduce hay needs and improve cattle condition. However, it will have a much reduced forage yield.

Another option, if you have fescue, is to add clover to the stand from mid to late February. I would use one of the Dutch types. You will want to graze the pasture down tight before planting. It is best to plant with a grain drill with a small seed attachment. Make sure to not place seed too deep. You can also look at planting crimson clover either in Fescue or with an oat-ryegrass mix. The clovers are going to help to improve forage quality. Just remember, if you spray a pasture after the clover is planted or before, you will either damage or kill the clover so you will need to go to clean pasture that doesn't have to be sprayed.

Pay attention to your weed pressure. If you have weeds, it will depend on what species of weeds you have has to what and when you spray. A lot of our weed problems can be handled in February and March. Remember to spray when weeds are small and not when flowering. When you see flowers, it is too late. Mark your calendar for next year to spray 2 months before you saw flowers and plan on spraying 3 years in a row.

Finally, as a producer, get your fertilizer out in a timely manner. This will improve your forage quality as well as improve pounds of production.

All predictors suggest we are looking toward a wet spring; therefore, planning ahead will be necessary.

Uniformity from Embryo Transfer

By: Sam Ingram, ANR Agent, Effingham County

More and more beef cattle producers are realizing the value of uniformity in cattle. Producers who compile a group of cattle for live or video sale understand that the buyer prefers uniformity. A great way to produce similar cattle is using embryo transfer. The use of this technology is possible for large or small operations, commercial cattlemen or seedstock producers.

The process of embryo transfer is simple in theory. The removal of an embryo or several embryos from the reproductive tract of a donor cow and transferring those embryos to a recipient cows is the "big picture" of this process, but, for someone looking at this as an option for their farm must think about superovulation, insemination, collection and evaluation of embryos, storage of embryos and then transferring those embryos to recipient or "recip" cows. This will take some planning but potential value of embryo transfer is vast.

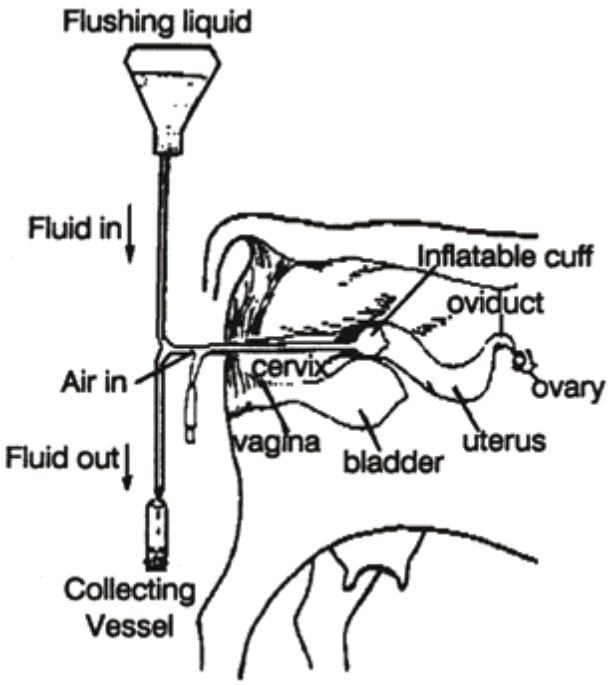

Figure 1. Diagram of embryo flushing recovery procedure.

There are an estimated 150,000 potential eggs in a single brood cow. In a perfect environment with natural breeding, a superior brood cow may produce 12 calves. This means a producer is only seeing a very small fraction of the potential this cow has to change a herd. Artificial insemination with superior genetics from bulls is a great way to achieve improvement in a herd. If a producer couples this practice with embryo transfer, the look and performance of a herd can change drastically in a positive way in a short period of time.

Planning was mentioned earlier in this article, and to be successful at embryo transfer or anything else for that matter, a plan needs to be in place. First, a producer needs to **identify a reputable embryo transfer** technician. If you are a member of Georgia Cattlemen's Association or have a good relationship with your veterinarian, you can ask if those people if they have had positive

experiences with embryo transfer technicians. Secondly, a producer needs to **select a donor cow**. Referring to records kept on farm, EPD's and overall functionality of cattle can be used to select a donor cow. **Ovulation of the selected donor cow** is the next step and this is usually when the technician comes into play. Maximizing the amount eggs collected is goal number 1, and the technician will have a plan in place to accomplish this goal. **Following ovulation is insemination**. The idea is to maximize the number of embryos at this point, so a technician may inseminate the donor cow at multiple times after the onset of estrus.

The next step is to flush and collect the embryos. This is an important step but relatively trouble-free and can be completed in a short time. Figure 1 gives an illustration of the flushing process.

Once the embryos have been collected, the technician will **evaluate the stage of development of the embryos and give them a grade**. The combination of these two factors will determine the selection of the best embryos. Just like selection of a donor cow, a producer must **select recipient cows**. A producer needs to look at milking ability and mothering ability in combination with calving ease and reproductive soundness. If a producer selects a poor recipient, the investment in this technology is lost. A calf must still "hit the ground" and be cared for to see the potential of this technology. Finally, **the technician will transfer the embryo to the recipient cow**. Any unused embryos that are still of good quality should be stored, in many situations the embryo technician will be able to store these embryos for the next breeding season.

Just like artificial insemination, this practice can vastly improve a cattle herd in a short period of time. And just like artificial insemination, beef cattle producers have been slow to adopt this practice. Embryo transfer does take time, money, more management and prior planning from producer but it can pay for itself in many situations.

Information from University of Arkansas' Extension publication FSA3119 "Embryo Transfer in Cattle" Tom R. Troxel was used to compose this article.

Oral Deworming Reduces Worms in Dairy Goats

By: S.C. Nickerson, Department of Animal and Dairy Science, University of Georgia, Athens

The dairy goat population in the United States is approximately 355,000, and about 3,000 of these animals are located here in Georgia. The consumption of dairy goat products continues to escalate as consumers seek foods with potential health benefits in addition to their nutritive value. As a result, goat milk producers are responding to the increased demand.

Parasitic infection with round worms is a major production issue

To be profitable, dairy goat operations need to produce milk efficiently, and unfortunately, gastrointestinal nematode (round worm) infections are a major deterrent to maximal milk yield. These parasitic herd infestations are quite common and can depress food intake and body condition, decrease milk production, and ultimately cause death. Animals harboring worms in their gastrointestinal systems may suffer from mild to severe anemia. This condition is largely caused by the Barber-pole worm, *Haemonchus contortus*, that attaches to the linings of the stomach and small intestine where it feeds on its host's blood, leading to severe anemia and death. Parasitic infections with other round worms, or the non-*Haemonchus* nematodes, also result in decreased production but rarely kill the host. However, in dairy goats receiving adequate treatment with anthelmintic products (agents used to eradicate parasitic round worms and alleviate anemia) increases in milk yield and quality can be realized.

Evaluation of an oral dewormer

A research trial was conducted in Conley, GA at Decimal Place Dairy to evaluate one such anthelmintic agent (Rumatel®, Morantel tartrate, Prince Agri Products, Inc., Quincy, IL). This product was fed at the rate of 45 grams/100 lb of body weight, and was incorporated into a feed pellet, which was provided to does in two doses of 0.75 lb in the AM and PM over a 24-hour period. Thirty-four Saanan does in early lactation were used to determine the effect of this deworming treatment by comparing the level of anemia

and fecal nematode egg counts before deworming with the level of anemia and egg counts 2 weeks later.

During the AM milking, does were fed 0.75 lb of Rumatel pellets. After milking, and while does were consuming their feed, the FAMACHA© eye color chart test (Figure 1) was used to evaluate the level of anemia for each doe. This was performed by observing the color of the mucous membranes of the right eyelid, which was compared to a FAMACHA chart bearing photographs of goats at 5 different levels of anemia: 1 (red, non-anemic); 2 (red-pink, non-anemic); 3 (pink, mild-anemic); 4 (pink-white, anemic); and 5 (white, severely anemic).

After scoring, fecal samples were collected by expressing 6-8 pellets using gloved fingers into zip-lock bags, which were stored on ice, and transported to the UGA Parasitology Laboratory. Samples were processed to determine 1) the total nematode egg count, 2) the *Haemonchus contortus* egg count, and 3) the non-*Haemonchus contortus* egg count using the modified McMasters and Peanut Agglutination tests.

Figure 1.

During the PM milking, the second feeding of Rumatel was provided. Two weeks later, FAMACHA scores were determined after the AM milking, followed by the collection of post-treatment fecal samples as described above. The level of anemia and fecal egg counts were compared to the pretreatment values obtained 2 weeks earlier to determine if deworming was successful in reducing these two parameters.

Trial results

FAMACHA scores:

Prior to treatment, FAMACHA scores of the 34 does averaged 2.79, which tended to be more in the mildly-anemic range (Figure 2). Two weeks after treatment, the FAMACHA scores decreased to 2.35 ($P<0.001$), which tended to be more in the non-anemic range. Thus, an improvement in the overall level of anemia in the herd was observed over this 2-week period.

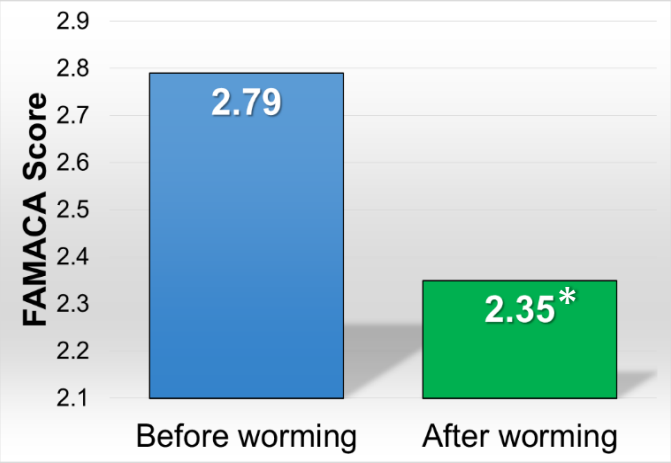

Figure 2. FAMACHA scores pre/post deworming.
*Different from before worming ($P<0.001$).

Total fecal egg counts:
Total fecal egg counts prior to treatment averaged 498.5 eggs per gram of feces (Figure 3). Two weeks after treatment, total fecal egg counts decreased to 192.7 (P<0.001), a decrease of 305.8 eggs per gram of feces. Thus, a reduction in egg counts of approximately 61% was observed over this 2-week period.

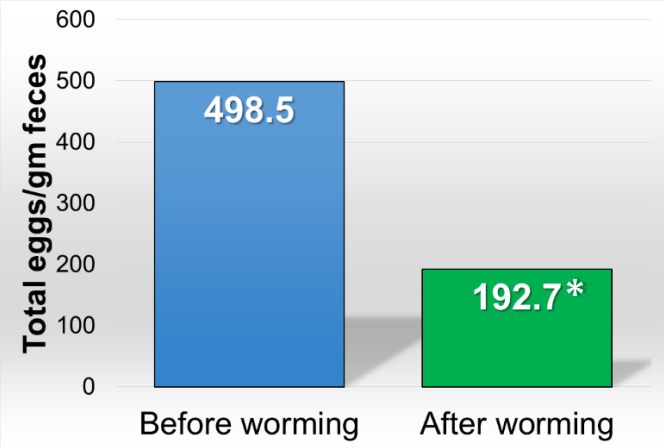

Figure 3. Total fecal egg counts pre/post deworming. *Different from before (P<0.001).

Haemonchus fecal egg counts:
Haemonchus fecal egg counts prior to treatment averaged 370.9 eggs per gram of feces (Figure 4). Two weeks after treatment, these fecal egg counts decreased to 184.9 (P<0.001), a decrease of 186 eggs per gram of feces. Thus, a reduction in egg counts of approximately 50% was observed over this 2-week period.

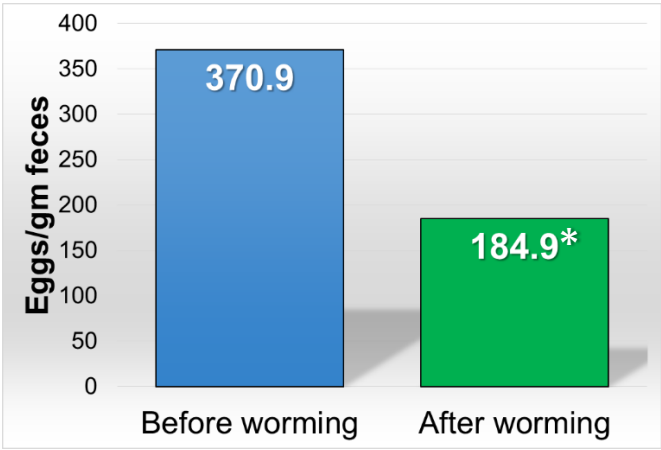

Figure 4. *Haemonchus* egg counts pre/post deworming. *Different from before P<0.008).

Non-*Haemonchus fecal egg counts:*
Non-*Haemonchus* fecal egg counts prior to treatment averaged 127.7 eggs per gram of feces (Figure 5). Two weeks after treatment, these fecal egg counts decreased to 7.9 ($P<0.001$), a decrease of 119.8 eggs per gram of feces. Thus, a reduction in egg counts of approximately 94% was observed over this 2-week period.

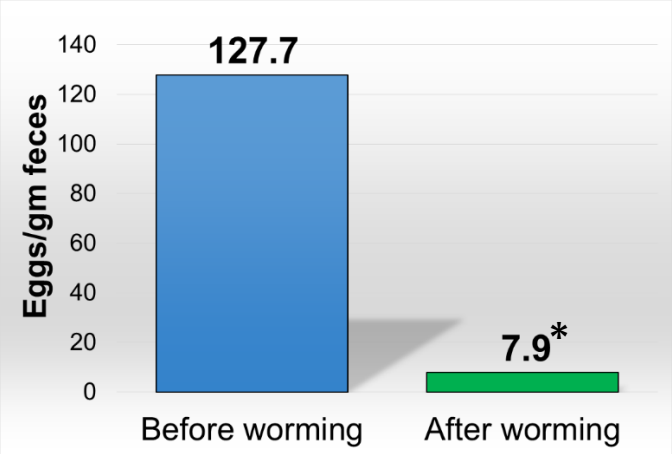

Figure 5. Non-*Haemonchus* egg counts pre/post deworming. *Different from before ($P<0.001$).

Summary
Results demonstrated that, under the conditions of this study, the anthelmintic agent used decreased the herd level of anemia as evidenced by reduced FAMACHA scores 2 weeks after the feeding of Rumatel. In addition, treatment lowered the total fecal nematode egg count as well as egg counts for *Haemonchus* as well as non-*Haemonchus* nematodes, suggesting that the reduction in blood-sucking worms was responsible for the fewer number of anemic goats observed. Whether this single worming with the anthelmintic agent used exerted any effects on milk production, milk quality, or other production parameters remains to be determined.

Keys to Successful 4-H Livestock Programming

Deron Rehberg, Grady Co. CEC/4-H & Ag

I have had the pleasure of serving as an Extension 4-H Agent in Grady County for almost 28 years now. It has been an enjoyable ride as Extension has allowed me to share my knowledge of livestock and showing with our 4-H youth. But with that being said, over the years Extension has lost most of its experienced livestock agents, especially those with showring experience. It is almost as if we are a dying breed that's quickly becoming extinct.

Since economic recovery began in the state of Georgia in 2012, UGA Cooperative Extension has filled many 4-H and Agriculture agent positions. While the candidates are well-trained in their educational fields, very few new hires have youth livestock program experience. Many county 4-H programs have strong livestock programs and clientele demand support. As agent positions are re-filled, clientele expect new hires to start work ready, willing and able to provide hands-on support and training for their 4-H youth who are involved in livestock show projects.

As an Agent who has over 40+ years of livestock show experience, I would like to offer a few suggestions on how you can start or maintain a strong livestock show program.

It all starts with a positive attitude and a willingness to work. A successful livestock show program requires a lot of hands-on effort by the Agent. From managing paperwork to attending shows, the view your clientele will have of you as an Agent will depend on your willingness to learn and work side-by-side with them during their show career.

The most important role an Extension Agent plays in a successful livestock show program is that of "information provider". It is our job to pass along all livestock related information to our show families. Especially information related to the Georgia 4-H/FFA State Livestock Shows, the Georgia National Fair, and your local livestock show. Your clientele will also need for you to pass along information on other multi-county, regional, and statewide shows as you receive it. A couple of easy ways to accomplish this task is to create an email distribution list of all your livestock exhibitors and each time you receive information on a show, simply forward it on to your show families. A second way of providing them with the information they need is to create a livestock show section on your county's 4-H webpage. There you can place links to shows you receive information on as well as links to other livestock show related websites such as Georgia 4-H's livestock page, the Georgia Junior Swine Boosters, the Georgia

Club Calf Producers Association, the Georgia Club Lamb Producers Association, and the Georgia National Fair. All of these webpages contain calendars that provide links to show related information exhibitors and their families need.

You will not only need to pass along show information, but you will need to be familiar with the rules, entry deadlines, and animal identification requirements for the major shows and your local show if you have one. The two major shows I am referring to are the Georgia National Fair and the Georgia 4-H/FFA State Livestock Shows. The exhibitor's family is responsible for entering their own animals online for the Georgia National Fair. You, the Extension Agent, are required to enter animals online for the Georgia 4-H/FFA State Market Goat and Lamb shows held in October and the State Market Hog, Steer, and Breeding Heifer, Doe, and Ewe shows held in February.

The most sincere way you can support your 4-H show exhibitors is to attend a few shows. When a 4-H'er sees their 4-H or Ag Agent at the show ringside watching them and taking pictures, it gives them a true since that you care about what they are doing. At minimum, I believe agents should attend the Georgia National Fair and the Georgia 4-H/FFA State Livestock Show with their show families. As for the many other shows they have the opportunity to attend, I suggest providing them with a letter at the beginning of the show season and list the shows that you plan to attend. That way they know what to expect from you before the show season ever starts.

Many of you may not have the technical expertise to help your exhibitors clip or fit their animals, however there are other ways you can assist your families while at the show. Once you arrive at the show, go to the office to get their stalling or pen assignment. You can help unload all the show equipment and set-up the tack area. Finally, when the show is over you can help in the tear-down and loading process. But most importantly, take a camera or your cell phone and get pictures of your exhibitors!

Some things that you need to make sure you remind your exhibitors of before they head to their first show is to make sure they double check their tattoos and tag numbers to confirm everything is readable and correct. They will need to have health papers to attend most shows in Georgia. New requirements are coming out from the State Veterinarian's Office for all species for the 2016-17 show season, so look for the new requirements sometime this spring. If 4-H'ers are showing purebred heifers, they must have the original registration paper in the 4-H'ers name and not in the farm name. It is most important that youth and families read and understand the drug testing policy if a show has one!

A final suggestion I would like to make is for you to periodically take time to make a personal visit to your exhibitor's home to check on their show project. You may not know what

you are looking at, but this would give the exhibitor the perfect opportunity to show you what they are doing with their animals as it relates to feeding, grooming, and health care.

As you prepare for a successful livestock show program, there is one more key ingredient you can't leave out - volunteers. If you are not a strong, livestock oriented agent, find a volunteer who is willing to guide you through the process and assist you with managing your program. A volunteer who is passionate about livestock and loves working with young people can be the secret to a successful show program.

A county livestock show program can bring you many joys during your Extension career but it can also cause you a lot of headaches if not managed correctly. I hope some of the suggestions I have made will help ensure your program's success. If I can ever be of assistance or a sounding board, please don't hesitate to give me a call at 229-377-1312. I will not promise to have all the answers, but I'll certainly listen and offer any suggestions I may have.

DNA TESTING: A MODERN TOOL FOR IMPROVED GENETIC EVALUATION

By: Jacob R. Segers, Ph.D. – Extension Beef Cattle Scientist, University of Georgia, Tifton

Introduction

In the spring of 1953, Watson and Crick published a one-page letter in the journal, Nature. The letter explained that they had discovered the three-dimensional structure of deoxyribonucleic acid (DNA). This letter also contained what is arguably the most famous understatement in scientific history, "This structure has novel features which are of considerable biological interest." Some 30 years later, Alec Jefferies developed a process for "genetic fingerprinting;" a process for identifying individuals based on their unique genetic code. Nine years after Jefferies' discovery, genetic fingerprinting was thrust into the lime light during the O.J. Simpson murder trial. Since that infamous verdict was handed down, the floodgates have opened on the expansion of DNA-based technologies across almost all sectors of the biological sciences. Right or wrong, in today's world, genetic testing is considered the strongest form of evidence in every situation from criminal trials to cancer screening, to paternity testing. If you just sensed a shift in gears, you are correct. In this case I'm not referring to Maury Povich's brand of paternity test, but rather the application of DNA-based technology to genetic improvement of beef cattle. Genomic testing is not necessarily a new idea in the eyes of science, but its application in today's beef industry is still met with some confusion. Much of this confusion is focused around terminology. Genetic terminology can be intimidating at first, but it is not insurmountable. Most companies that market genetic testing technology will be happy to walk you through an interpretation of the results. Also extension agents and specialist have access to a great deal of information on these technologies. Still, apprehension and confusion needs to be addressed as the results of genomic testing have become a powerful tool for progressive producers to use in the establishment of breeding plans as well as evaluation of potential breeding options.

Testing for Parentage or Simply-Inherited Traits

Genetic testing, not unlike EPDs are based on the principles of inheritance. Inheritance is most easily explained using "simply-inherited" traits. Simply-inherited traits are controlled by a single gene. For cattlemen, color and horned status are the best examples. We all remember the days when almost every conversation about a potential herd sire involved the words "homozygous black and homozygous polled." Black color status is controlled by a single gene with two possible outcomes: black calf or red calf. These outcomes are dependent upon which

two alleles (versions of the gene) the animal possesses. Animals always have two alleles, or versions, for each gene (one from sire and one from dam). The black allele is dominant to red. This means that a black animal may carry two black alleles or one black and one red allele. Because the red allele is recessive, an animal must possess two copies of the red allele for the animal to actually be red in color. A similar situation exists for horned status where the horned animal carries two copies of the recessive allele.

The idea of parents donating a copy of each allele to the offspring is the basis for parentage testing in cattle. Parentage testing has been available for a while, but is extremely useful for producers who expose cows to multiple sires, or employ a clean-up bull after AI exposure. Genotyping the animals allow for the true sire to be correctly identified. These genetic tests promote informed breeding and culling decisions by helping to identify bulls that are making the largest amount of progress toward the producer's genetic goals. Unlike simply-inherited traits, parentage tests looks at the expression of many genes or markers to compare calf to parent with greater certainty.

For Example: Let's say we have a calf with two potential sires. For simplicity's sake, we will examine only one gene.

Calf		**Dam**		**Sire 1**		**Sire 2**	
Gene 1		Gene 1		Gene 1		Gene 1	
Allele 1	Allele 2	Allele 1	Allele 2	Allele 1	Allele 2	Allele 1	Allele 2
A	**B**	**B**	**B**	**A**	**B**	**B**	**B**

We can see by the presence of the A allele or "marker" in the calf that Sire 1 must be the calf's true sire. There is no possible way for a mating between the dam and Sire 2 to result in a calf that is a carrier of the A allele.

Reading Genetic Test Results

Recently, genetic testing for beef cattle has evolved to include "high-throughput" testing. This is a tremendous advantage for the producer because most economically important traits like calving ease, dry matter intake, feed efficiency, hot carcass weight, marbling score and tenderness, are controlled polygenically or by many genes, as opposed to a single gene like color or horned

status. This means that many modern tests can make predictions about the performance and genetic value of an animal earlier in life than traditional EPDs.

When attempting to interpret the results of high-throughput or high-density genetic tests it is important to understand the difference between the traditional EPD and a breeding value because test results are often expressed as breeding values. Breeding values may be molecular or phenotypically-based and are equal to twice the EPD. This is because breeding values represent the genetic potential of the tested animal; whereas, an EPD represents the genetic potential of an animal as a parent. As a parent, an animal only contributes half of its genetic material to the offspring; thus, an expected PROGENY difference is equal to half of the breeding value. Results or breeding values will be presented in units relevant to the trait in question (e.g. gain will be in pounds).

It is important to understand that even high-throughput tests only measure a portion of the genes that control a specific trait. Let's say a producer has genetic test results that indicate a sire may be superior for a certain trait, compared to a second sire, and the available EPDs contradict this, the EPD is more dependable. This is because the EPD is related to performance which is a product of all of the genes that affect the trait; whereas, the genetic test results are only accounting for the portion of the genes analyzed by the test. Much like EPDs, genetic testing results or breeding values will have accuracies associated with them. Although they look alike, raw test results and EPDs are not calculated the same way and cannot be compared directly.

Genetic Tests, EPDs and GE-EPDs

Okay, so contrary to what you may be thinking, the conclusion of the previous section is NOT that genomic tests are less valuable than EPDs. The two are not the same thing and thus cannot be compared; yet, given the miracle of mathematics the results of genetic testing can be used to strengthen EPDs. The big gamble with using EPDs as gospel is the accuracy of the prediction in young cattle that have few if any progeny. The lack of confidence associated with EPDs on young cattle comes from simply not knowing which alleles an animal inherited from its parents. In young bulls, for example, most of their genetic value is based on their pedigree. As these animals age and have offspring, we know more and more about which alleles were passed to the sire in question. This increased confidence is denoted by an increase in the accuracy value (0 – 1 scale) associated with each EPD. Samples of DNA can be collected very early in life, and unlike metabolism or hormones, the genetic code does not change over the course of an animal's life. Genomic testing allows producers to take a virtual snapshot of a portion of the genes that regulate economically important traits. This increased knowledge of the genes possessed by an animal allows for increased confidence in the EPD. These numbers are called genetically-enhanced EPDs (GE-EPDs). The most comprehensive of these technologies are specific to the

Angus breed due to larger number of individuals tested. Other breeds have developed GE-EPDs. These breeds include Hereford, Simmental, Red Angus, Gelbvieh, and Limousin, although these breeds may use different mathematical techniques for incorporating genomic data into EPDs. Using genetic testing in beef cattle operations allows early prediction of genetic merit and increases the value of young breeding stock. Some of the traits which are assessed are expensive to measure in the live animal (e.g. reproductive traits, feed efficiency, or tenderness). Cost of using this technology is decreasing as time passes, but it is important for producers to analyze the economics before employing this tool to ensure that it is economically justifiable.
For more information on genetic testing, contact your local extension agent or dial 1(800) ASK-UGA-1.