

Livestock Update

Beef - Horse - Poultry - Sheep - Swine

June 2015

This LIVESTOCK UPDATE contains timely subject matter on beef cattle, horses, poultry, sheep, swine, and related junior work. Use this material as you see fit for local newspapers, radio programs, newsletters, and for the formulation of recommendations.

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Scott P. Greiner, Extension Project Leader
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Dates to Remember

BEEF

July

- 17 2015 Virginia Cattle & Dairy Expo Field Day. Virginia Tech's Kentland Farm, Blacksburg, VA. Please RSVP for lunch by calling the VCA office at 540-992-1009 or Email Jacquelyn Davis at jdavis@vacattlemen.org

August

- 6 Tri-State Beef Conference. Washington County Fairgrounds in Abingdon, VA. Additional information can be obtained through your local Extension office or on the web at <http://economics.ag.utk.edu/conferences.html>.

HORSE

SEPTEMBER

- 10 -13 State 4-H Horse Show. Virginia Horse Center. Lexington, VA.

Contact: Celeste Crisman, (540) 231-9162 or email: ccrisman@vt.edu

June Herd Management Advisor

Scott P. Greiner & Mark A. McCann
Extension Beef Specialists, Virginia Tech

June normally marks the conclusion of harvesting the first cutting of hay and hoping for rain to stimulate regrowth. Equal attention should be given to pasture management in an effort to minimize future hay consumption. Pasture management now can impact future forage growth and vigor. Research has repeatedly shown that rotational grazing which insures a rest period can make grasses more productive. Generally 3-4 weeks of rest is recommended. That means weekly rotation among four pastures can accomplish the desired rest period. Rotational grazing does require some planning, time and inputs but the return is 25-33% more forage and cows that are at the gate when you rotate pastures. Other benefits include enhanced forage diversity, reduced cattle trails, better distribution of nutrients, and improved ground cover of sensitive areas.

Although the official start of summer isn't until the 21st of the month, summer conditions have already made an appearance. Pasture rotation during the summer months will guarantee a rest period for forages yielding a more productive, diverse pasture. Hot weather also signals the onset of fly season. Delaying fly tag application in early summer extends protection into the warm days of early fall.

Spring Calving Herds (January-March)

General

- Focus on forage management, pasture rotation, cow nutrition and young calf health.
- Manage first-calf heifers separately; give them best forage and supplement
- Cattle comfort should be monitored ensuring adequate shade and availability of clean water

Nutrition and Forages

- Continue feeding high magnesium minerals to prevent grass tetany; may be able to switch to high Se mineral as grass matures.
- Complete harvest of first cutting hay early in month
- Start grazing warm season grasses
- Implement rotational grazing management system which will provide a rest period for pastures.
- Cool season grasses are now mature; if weather conditions are dry delay pasture clipping until there is adequate soil moisture for forage regrowth.
- Make plans to store your high quality hay in the dry.
- Collect and submit forage samples for nutrient analysis.

Herd Health

- Implement parasite and fly control program for herd. Delay application of fly tags until a threshold of about 100 flies per side
- Administer mid-summer deworming and implant calves late in month or early next month
- Plan vaccination and preconditioning protocol for calf crop.
- Castrate commercial calves if not done at birth, consider castrating bottom end of male calves in seedstock herds.

Reproduction

- Finish AI; turn out clean-up bulls
- Remove bulls from replacement heifers after 45 day breeding season
- Make plans to pregnancy check heifers as soon as possible after bull removal. This will allow options in marketing open heifers.
- Use 48 hour calf removal for thin cows and first-calf heifers at beginning of breeding season
- Monitor bulls closely during the breeding season. Observe frequently to confirm breeding performance and soundness, and monitor cows for repeat estrus. Avoid overworking young bulls (a rule of thumb- yearling bulls should be exposed to number of cows equal to their age in months).

Fall Calving Herds (September-November)

General

- Plan a marketing strategy for open cows. Cull cow prices typically peak mid-spring through mid-summer, and prices generally stronger for cows in good body condition vs. thin cows (evaluate forage availability and potential feed and management costs to increase BCS of cull cows if warranted).
- Finalize marketing plans for calf crop. Time weaning, vaccination program, and weaning management to meet operational goals. Calculate break-evens on various marketing options and consider risk management strategies.
- Reimplant commercial calves.

Nutrition and Forages

- Switch to high selenium trace mineral salt
- Body condition score cows. Plan nutrition and grazing program based on BCS. This is the most efficient period to put weight and condition on thin cows
- As calves are weaned move cows to poorer quality pastures.
- Use palatable feeds during the weaning period to bunk train calves and minimize weight loss.
- Reserve high quality hay and a pasture area for calves post-weaning.
- Start grazing warm season grasses

Herd Health

- Administer mid-summer deworming on replacement heifers and pregnant heifers
- Implement parasite and fly control program for herd. Delay application of fly tags until a threshold of about 100 flies per side.
- Consult with veterinarian on vaccination protocol for calf crop. Design vaccination and weaning program around marketing goals and objectives. Vaccinate, wean, and certify calves to be marketed in late summer

Genetics

- Identify replacement heifers. Utilize available tools including genetics, dam performance, individual performance, and phenotype. Restrict replacement heifer pool to those born in defined calving season.
- Finalize plans for post-weaning development and marketing of bulls in seedstock herds.



2015 Virginia Cattle & Dairy Expo Field Day July 17, 2015 at Kentland Farm

Join cattle producers at Virginia Tech's Kentland research farm near Blacksburg, VA for a day of fellowship, education, good food, exhibits and the Virginia Cattlemen's Association annual business meeting.

Agenda

10:00 AM Registration, Exhibits, and Equipment Trade Show Open

10:30 AM Continuous educational tours begin with transportation between sites provided

- **Dairy Science facility:** see the newly completed Dairy Center for Virginia Tech along with a guided tour of the infrastructure
- **Animal Science Beef feedlot & reproductive center:** Animal Science department faculty will show folks around the facility as well as discuss current basic research in the department
- **Aerospace & Ocean Engineering Drone Airport:** one of six drone airports nationwide, see how drone technology and how it is supporting agricultural research
- **Kentland Plantation home:** the history of Kentland Plantation is rich and an interpretive tour of the manor home and farm's history will be offered

11:30 AM Continuous free BBQ lunch served by the Virginia Tech Block & Bridle Club

Please RSVP for lunch by calling the VCA office at 540-992-1009 or emailing Jacquelyn Davis at jdavis@vacattlemen.org

Noon Remarks from Governor Terry McAuliffe and Virginia Tech President Dr. Timothy Sands as well as others invited officials and guests to honor the Virginia cattle business and dedicate the newly constructed Virginia Tech Dairy Center

2:30 PM Virginia Cattlemen's Association annual business meeting

3:00 PM Adjournment and end of day

Directions to Kentland Farm: drive west from the Town of Blacksburg and past Blacksburg High School on Prices Fork Road approximately 2 miles, turn right onto McCoy Road (Route 652) and travel just over 3 miles to a left on Whitethorne Road (Route 623) and Kentland Farm entrance will be at the end on right. Follow signs on gravel drive to meeting headquarters near drone airport.



ENGLISH

VT Dairy Relocation

5-3-15

**TRI-STATE Beef Conference to be Held August 6th, 2015
In Abingdon, VA**

Dr. Scott P. Greiner
Extension Beef Specialist, Virginia Tech

The Eighth Annual Tri-State Beef Cattle conference will be held at the Washington County Fairgrounds in Abingdon, Virginia on August 6th. This year's conference will address topics of interest to both stocker and cow-calf producers. The conference will be a one-day event and will include educational sessions covering such topics as beef cattle outlook, extending the grazing season while improving soil health and managing weeds, hoof conformation and selecting breeding stock, receiving programs for stocker producers along with new products and how they are intended to be used, and the importance of a lender relationship. There will once again be virtual tours of operations from each of the three states and then a time of questions and answers with the producers themselves. "This year's conference will be one that should add dollars to your bottom line whether you run a stocker or a cow-calf operation," stated Dr. Andrew Griffith, University of Tennessee Extension Assistant Professor and Extension Livestock Economist.

A trade show will be open during the conference, with many of the organizations involved in the region's beef industry there for participants to meet and learn more about their products and services.

The conference will begin with registration at 8:00 a.m. and the program beginning at 9:20 a.m. The trade show will open at 8:00 a.m.

The meeting is being sponsored by the University of Tennessee Extension, Virginia Cooperative Extension, and North Carolina Cooperative Extension. Registration information and complete details will be available through your county Extension Office. Registration for the conference is \$20 through July 30th and \$25 after July 30th. Additional information can be obtained through your local Extension office or on the web at <http://economics.ag.utk.edu/conferences.html>.

Understanding and Coping With Summer Slump

Dr. Mark A. McCann

Extension Animal Scientist, Virginia Tech

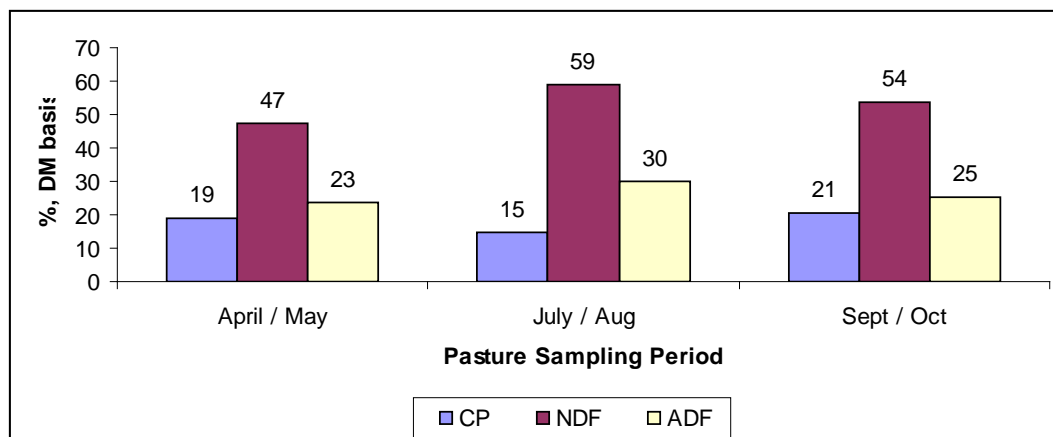
As beneficial as late spring moisture has been for Virginia pastures and cattle performance, everyone typically cringes at the thought of the heat and many times the dryness of our July and August. This seasonal decline in pasture and cattle performance during this period is usually called “summer slump”. Infected Kentucky 31 tall fescue gets most of the blame and is certainly a major contributor, but there are other factors in addition to fescue toxicity that come into play and contribute to this seasonal slump.

Most Virginia forage programs are based on cool season perennials such as tall fescue, orchard grass and bluegrass. These grasses are most productive at temperatures of 60-80 °F and production will decline at temperatures above 80°F, even when moisture is adequate. This depression gets worse if accompanied by low rain fall. This general response in tall fescue is related to growth habit and not endophyte status. In fact, fungus infected tall fescue has demonstrated that it is more resistant to drought than fungus-free varieties. One of the characteristics of this grouping of grasses is their lower performance and lower nutrient content during hot weather. Tall fescue quality, as measured by forage analysis, exhibits a seasonal change in sugar content and digestibility. Protein content in green, leafy tall fescue leaves can be high throughout the season (Table 1). Digestibility and sugars are highest in fall, intermediate during spring, and lowest in summer. Palatability follows essentially the same trend as digestibility and sugar content (i.e., most palatable in fall, least in summer, and intermediate in spring).

Table 1. Seasonal composition and digestibility of tall fescue

	Spring	Summer	Fall
Sugars, %	9.5	8.5	19
Crude Protein, %	22	18	19
D.D.M., %*	69	66	74

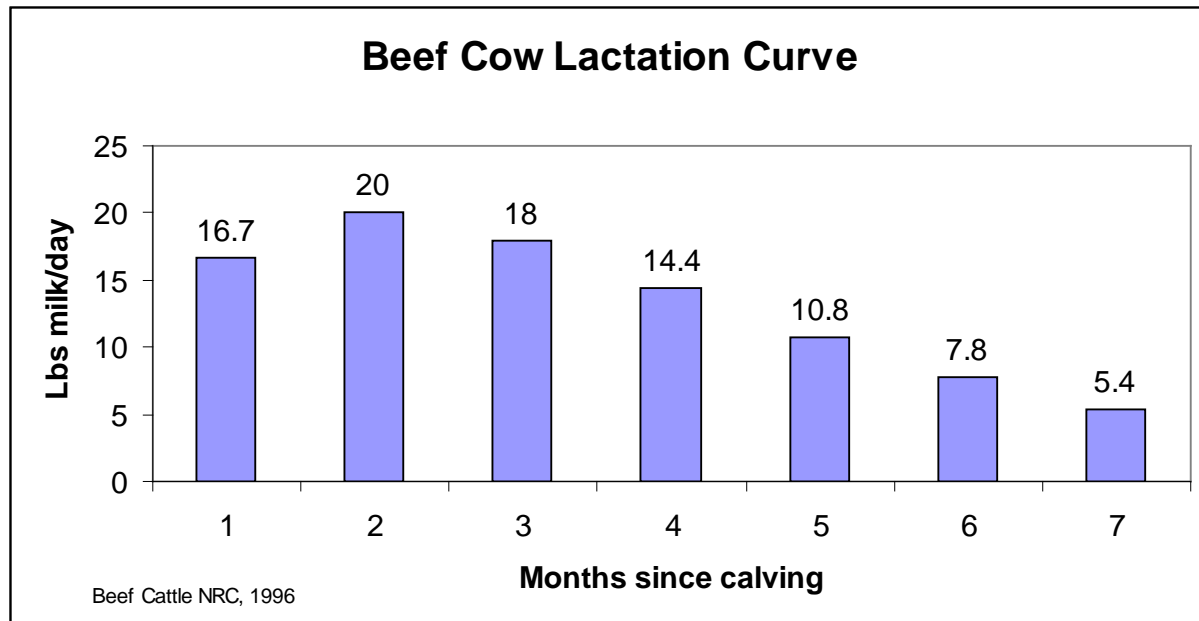
*Digestible Dry Matter. Lacefield et al., 2003



Pasture hand samples of endophyte-free fescue at the Kentland research farm during the 2009 grazing season would follow a similar pattern with the lowest crude protein and highest fiber values during the months of July and August.

Legumes such as ladino clover, red clover and alfalfa are more tolerant of warm temperatures and can contribute to the forage on offer if they are present in the pasture mix. The presence of legumes or other grasses in cool season pastures can be impacted by the management of the spring flush of grass growth. Tall standing forage can shade out clovers and other contributing plants. Tall fescue is more prone to do this due to its combination of height and density. Managing this spring flush through grazing management and/or harvesting excess growth as hay is important to maintain clover stands and allow other summer grasses to contribute (crabgrass, Bermuda grass, etc) to the forage mix.

For spring born calves, another potential contributing factor to a summer slump is the stage of milk production of their dam which is illustrated in the following figure.



To add further context to the lactation curve above, keep in mind that the calf receiving 20 lbs of milk/d probably weighed 150 lbs and the calf receiving a far smaller amount of milk at 6-7 should weigh 400-500 lbs. Therefore the performance of the 6-7 month old calf is much more of a reflection of the forage quality and quantity on offer than their limited milk intake. Unfortunately, for spring born calves, this corresponds to July and August summer slump in forage growth and nutrient content.

The negative impact of endophyte infected tall fescue compounds and intensifies the previously discussed forage growth and cow lactation issues. Most researchers agree that the toxins responsible for tall fescue toxicosis are ergot alkaloids, a class of compounds produced by the endophyte. Ergot alkaloids are highly concentrated in the seed, though they can be measured in the leaf and stem tissue as well. The effects of the toxins are most visible during the summer months. Grazing activity and forage intake are depressed on endophyte infected pastures during the summer months which lead to reduced cattle performance.

Management suggestions:

- 1) The age old suggestion for diluting infected tall fescue still works. The dilution can be other grasses, legumes or even supplemental feed, anything that takes the place of infected tall fescue.
- 2) Managing pastures through clipping or grazing management to reduce seed heads and stems which contain higher toxin levels. These management practices will produce a more open forage canopy which will prevent shading of diluting forages such as clovers and warm season grasses.
- 3) Given this year's combination of affordable feed costs and high calf prices, creep feeding is probably an economical decision to add profitable weight

**Details Announced for 2015-16
Virginia BCIA Central Bull Test Station Program**

Joi D. Saville
Extension Associate, Beef, Virginia Tech

The Virginia Beef Cattle Improvement Association will begin its 58th year of sponsoring the Virginia's Central Bull Test Station Program. Rules and regulations for the upcoming test and sale season are now available through Virginia BCIA. A total of three test groups of bulls will be developed and sold from the two stations located at Culpeper and in Southwest Virginia.

The Culpeper Senior test is conducted at Glenmary Farm in Rapidan, VA, owned and operated by Tom and Kim Nixon. The Southwest Bull Test Station is located at Hillwinds Farm owned by Tim Sutphin of Dublin, Virginia. At the Culpeper station, a set of fall-born Senior bulls will be developed. The Southwest Test Station will develop both a set of fall-born Senior bulls, as well as spring-born Junior bulls. In addition to the traditional tests, the opportunity exists for breeders to custom feed bulls through the

BCIA program so that contemporary groups may be maintained. Additionally, provisions to the program allow breeders flexibility in developing both sale-eligible and custom tests bulls. The following table provides details of age requirements, entry deadlines, and the test and sale schedule for each group of bulls.

CULPEPER SENIOR BULLS	
Birth Dates	August 15 – November 30, 2014
Entry Deadline	June 15, 2015
Delivery of Bulls	June 30, 2015
Start Test	July 14, 2014
Finish Test	November 3, 2015 (112 days)
Sale	Saturday, December 12, 2015

	SOUTHWEST SENIOR BULLS	SOUTHWEST JUNIOR BULLS
Birth Dates	September 1 – December 31, 2014	January 1 - March 31, 2015
Entry Deadline	September 5, 2015	September 5, 2015
Delivery of Bulls	October 6, 2015	October 6, 2015
Start Test	October 27, 2015	October 27, 2015
Finish Test	February 16, 2016 (112 days)	February 16, 2016 (112 days)
Sale	Saturday, March 26, 2016	Saturday, March 26, 2016

Again this year, we will feature the enhanced bull guarantee which covers fertility, structural soundness problems (including foot soundness), and other issues on all bulls sold through the program. To compliment this good-faith guarantee, fall-born senior bulls will be subject to a semen evaluation as part of breeding soundness exam required for sale eligibility. Volume discounts will be available to bull buyers purchasing three or more bulls at a BCIA bull sale.

Registered bulls of any recognized beef breed, or recorded percentage bulls of breeds which have an open herd book are eligible for the central tests. All bulls must be recorded in their respective breed association, and have a complete performance record (including EPDs). Bulls must also meet breed-specific minimum YW EPD requirements, individual performance specifications, as well as pre-delivery health and management protocol to be eligible for the tests.

Breeders in Virginia and bordering states who are members of Virginia BCIA are eligible to consign bulls. For details and copies of the rules and regulations as well as entry information regarding the central bull tests, contact the Virginia BCIA office at 540-231-9159 or visit <http://www.bcia.apsc.vt.edu>.

Youth Events Popular At 2015 Junior Beef Roundup

Joi D. Saville

Extension Associate, Beef, Virginia Tech

The 2015 Virginia Beef Expo and Junior Beef Roundup show were held at the Rockingham County Fairgrounds in Harrisonburg, VA, April 17-19, 2015. The Youth State Stockmen's Contest started off the youth events on Friday, April 17th. The 2015 Junior Stockmen's Contest consisted of 105 junior and 88 senior competitors that are in the 4-H or FFA programs. The contest consists of a livestock specific quiz, identification of livestock equipment, breeds, feeds, and meat, judging of live sheep, live cattle, meats, and hays. This year the contest featured a keep/cull class, questions on meats and hays, and a judging scenario judged solely on data. The winning Senior team will go on to compete at the National 4-H Stockmen's Contest that will be held later this fall in Louisville, KY. This year's winners are from Shenandoah County 4-H. Team members include: Haley Shoemaker, John Robert Helsley, Gracie Bailey, and Tiffany Heishman. In addition to Shenandoah, a congratulations goes out to our top 5 Senior teams, Frederick County 4-H, Augusta County 4-H, Sherando FFA, and Rockingham County 4-H. The top 5 Senior Individuals were: 1st Place – Haley Shoemaker (Shenandoah County) 2nd Place- John Robert Helsley (Shenandoah County), 3rd Place- Cody Boden (Frederick County), 4th place-Kaylee Greiner (Montgomery County), and 5th Place- Nicole Masiello (Sherando FFA).

Top honors were also awarded in the junior division, which consists of youth ages 9 – 13. The top five teams were (in descending order) – Rockbridge County 4-H, J Frank Hillyard FFA, Montgomery County 4-H, Frederick County 4-H, and Augusta County 4-H. The top 5 junior individuals were: 1st Place – Zach McCall (Augusta County), 2nd Place- Ethan Clouse (Montgomery County), 3rd Place- Jordan Strickler (Augusta County), 4th Place- Mikayla St. Clair (Frederick County), and 5th Place- Peyton Fravel (J Frank Hillyard FFA).

The State Youth Cattle Working Contest was held on Saturday, April 18th. Earlier this spring, five regional contests were held in various locations across the state to determine the Top 10 teams that would be represented at the 2015 State Youth Cattle Working Contest. A total of 43 teams competed at the regional levels.

The State Youth Cattle Working Contest, as well as the regional contests, begins with teams completing a cattle processing map. This processing map is judged and returned to the team with any corrections prior to the team working the cattle. The teams then work a total of three head of cattle and are judged on the preparation and administration of a growth implant, a 7-way clostridial vaccination, a respiratory complex, ear tags, dewormer, and any other products that are deemed appropriate. In addition, the teams are also judged on the safety and handling of the cattle, as well as the time it takes to work all three head. For the 2015 State Youth Cattle Working Contest, first place was awarded to Grayson County 4-H, which consisted of Ethan Halsy, Shane Osborne, and Garrett Shumate. Orange County Team A (Blake Hopkins, Robert Nixon, and Zach Swoope) took home second place honors. Third place honors were awarded to Rockingham County Team A (Caley Ellington, James Ritchie, and Alec Turner). Congratulations to all those teams that made it to the state level.

The Youth Meat Quality Assurance (YMQA) Program hosted youth training in conjunction with the Junior Beef Roundup. The youth learned proper animal management, husbandry, and handling techniques while at the training. By attending the classroom portion of the training youth were certified in the Youth Pork Quality Assurance Plus program; youth who participated in both the classroom and chuteside training were Beef Quality Assurance certified. Both YPQA Plus and BQA certifications are recognized as national certifications through the Virginia Department of Education and are both part of the YMQA certification program that is administered through Virginia Cooperative Extension. All youth participating in these trainings will be fully eligible to compete at the State Fair of Virginia held in October.

The 2015 State Cattle Sales Contest was held Saturday morning, April 18th, of the Junior Beef Roundup. The objective of this contest is to gain a working understanding of performance and pedigree information. Competing teams were to take pedigree information, marketing materials, and an animal to a panel of judges and attempt to sell the judges that animal, based on a pre-chosen scenario. Top Junior honors went to the Junior Angus Association (Samantha Moore, Suter Clark, and Chet Boden). Top Intermediate division honors went to the Montgomery County 4-H and their team members: Ethan Clouse, Francesca Shaver, and Sidnie Saville. The Senior Division was won by the Junior Angus Association, a team consisting of Cody Boden, Jake McCall, Caleb Boden, and Zach McCall. Rockbridge County 4-H, Lindsey Fenster, Jenna Hamilton, and Sarah Harris took home second place honors.

The 2015 State Cattle Fitting Contest began Saturday afternoon. This contest was open to exhibitors at the Junior Beef Roundup and encourages youth to gain the ability to work with a team to enhance the showing performance of a groomed animal. The 2015 Contest saw three

teams compete. The Intermediate Division (ages 13 – 15) was won by the Junior Hereford Association: Brent Hostetter, Ashley Hostetter, Jenna Hamilton, and Olivia Williams. The Junior Angus Association won the Senior Division (ages 16 – 19) of the cattle fitting contest. Their team members included Jake McCall, Zach McCall, Caleb Boden, and Cody Boden. Second place went to Shenandoah County 4-H, with team members Bethany Gochenour, Kara Hockman, MaKaylyn Nesselrodt, and Shianne Nesselrodt. The Youth Cattle Fitting Contest would like to thank Sullivan's Show Supply for sponsoring the 2015 event.

The Junior Beef Roundup hosted nearly 180 exhibitors, 57 commercial heifers, 144 prospect steers, and 141 breed entries, making for a grand total of 342 head shown throughout the weekend. The youth beef shows started off with the Showmanship division, held Saturday evening. Top honors went to Courtney Durrer in Senior Showmanship, Zach McCall in Intermediate Showmanship, Henry Alexander in Junior Showmanship, and Ryan Borer in Novice Showmanship. Reserve champion showman was awarded to: Cody Boden in Senior Showmanship, J. Gordon Clark in Intermediate Showmanship, Shianne Nesselrodt in Junior Showmanship, and Suter Clark in Novice Showmanship.

Sunday featured the youth registered breed shows, as well as the commercial heifer and prospect steer shows. The Youth Angus Show saw a very strong showing of 63 head of Angus cattle. The Overall Grand Champion Angus Heifer was exhibited by Bryce Bowman of Barboursville. The Overall Reserve Champion Angus Heifer was awarded to Zach McCall of Greenville, VA. Other Angus honors included: Grand Champion Bred & Owned Angus Heifer – Callie Eastin; Reserve Champion Bred & Owned Angus Heifer – Zach McCall; Grand Champion Owned Heifer – Bryce Bowman; Reserve Grand Champion Owned Heifer – Zach McCall; Grand Champion Angus Steer—J. Gordon Clark; and Reserve Champion Angus Steer —Robert Nixon.

The youth Hereford show followed the Angus show. The Hereford show featured 26 head of cattle. The Overall Grand Champion Hereford Heifer was awarded to Blake Keppel of Harrisonburg, VA. Hannah Craun from Bridgewater received the Overall Reserve Grand Champion Hereford Heifer. Other honors included: Grand Champion Hereford Steer – Will Clark; Reserve Champion Hereford Steer – Walker Bowman; Grand Champion Bred & Owned Hereford – Abigail Allen; and Reserve Champion Bred & Owned Hereford – Rachel Bryan.

The youth Simmental Show followed with 16 head. Overall Grand Champion Purebred Simmental Heifer honors were awarded Kelsey Powers-Barb of Boston, VA. Reserve Champion Simmental Heifer was exhibited by Carlee Taylor from Saltville, VA. The All Other Breeds division saw breeds such as Limousin, Percentage Simmental, MaineTainers, Lim-Flex, and Shorthorn compete for top honors. Samantha Moore of Raphine won the AOB Grand Champion Heifer with a Lim-Flex heifer. Courtney Durrer of Ruckersville exhibited the AOB Reserve Champion Heifer, a Shorthorn.

Sunday morning also featured with the Youth Commercial Heifer show and was followed by the Youth Prospect Steer Show. Charles Hoofnagle of Lexington won the Grand Champion Commercial Heifer and Caley Ellington from Linville was the exhibitor of the Reserve Champion Commercial Heifer. Grand Champion Prospect Steer honors went to Matthew Ferrari of Purcellville, VA, while Jenna Kibler of Edinburg won Reserve Champion Prospect Steer.

The Overall Supreme Champion Heifer drive rounded out a great weekend of events. This Supreme Drive saw the overall champions from all the youth heifer shows. Bryce Bowman, from

Barboursville, VA exhibited the Overall Supreme Champion Heifer, the winner of the Angus show. The Reserve Supreme Champion Heifer was exhibited by Kelsey Powers-Barb of Boston, VA, with her Simmental Heifer.

Managing Internal Parasites

Dr. Scott P. Greiner
Extension Sheep Specialist, Virginia Tech

A significant health issue faced by sheep producers in the Mid-Atlantic region is internal parasites. As the level of parasite drug resistance increases, control programs based solely on anthelmintic drugs are becoming less effective. The prevalence of drug resistant worms is increasing, and new drug products to control worms are generally not available.

The most important worm parasites reside in the stomach and intestine. They are nematodes and belong to a family called trichostrongyles. Throughout the U.S., and especially in the mid Atlantic and southern states, the most important member of this family is the barber pole worm (*Haemonchus contortus*). The barber pole worm is a bloodsucking parasite that causes anemia, leading to poor performance and frequently death. Bottle jaw is a result of *H. contortus* infection, but unlike other parasites *H. contortus* does not usually cause diarrhea.

In order to effectively control parasites, it is important to understand the life cycle of the parasite. Adult female worms produce eggs that are passed in manure. Larvae hatch, and go through several stages of development in the environment before they infect the next host. During the warm months of the year enormous numbers of larvae can build up on pastures. Virtually all worms need pasture for successful development; as they do not survive well on dirt lots or in the barn. The success of larvae outside the host depends on the climate. Moisture and warmth are necessary for development and survival. Dry weather is very hard on these larvae once they are out on the grass. *Haemonchus* larvae also undergo a process called *arrested development* where they sit quietly in the stomach following infection and don't develop into adults until several months later. This is an important adaptation for keeping the worm population viable through cold winters when eggs and larvae don't survive well on pasture. The worms that became arrested in the fall resume development in the spring and reproduce. Parasites are an animal health issue that accompanies raising sheep. Since we cannot eradicate them completely, the goal is to maintain the parasites at a level that will not produce significant illness or economic loss.

Drug resistant *Haemonchus* are widespread throughout the world in sheep and goats and the problem has increased in the U.S. Drug resistance in parasites has been demonstrated to be passed from one generation of worms to the next. As the proportion of resistant worms increases generation after generation, effectiveness of drug for treatment is likewise reduced. Continuous exposure of a population of worms to the same drug has also been demonstrated to hasten resistance. Drug resistance is not easily diagnosed in a flock, since drug ineffectiveness is also caused by such factors as under dosing, using expired drugs, inappropriate administration, and very high levels of parasitism (fast reinfection due to high worm loads on pastures). Often, resistance is not readily obvious until a drug is virtually ineffective and significant losses in production or even deaths occur.

The quantitative method of determining resistance is to perform a Fecal Egg Count Reduction Test. This process involves collection of initial fecal samples from approximately 10 sheep. The sheep are then dewormed, and 7-10 days later a second fecal sample is collected from the same sheep. Some untreated sheep should also be sampled at the same times. The number of parasite eggs is counted in each set of fecal samples and the percentage reduction after treatment is determined. Fecal egg counts are currently not performed by the state labs. The parasitology lab at the Virginia-Maryland Regional College of Veterinary Medicine can assist producers with these tests (contact Dr. Anne Zajac, 540-231-7017, azajac@vt.edu).

Given the widespread development of resistance, step should be taken to minimize and delay the onset of parasite resistance. The following procedures are important in minimizing and slowing down the development of parasite resistance:

- 1) Reduce the number of deworming treatments (see below).
- 2) Use the correct dose according to label directions, and do not under dose. Divide sheep into weight categories, dose for the heaviest animal in each category.
- 3) Use a product that is fully effective. All of the available modern dewormers fall into 3 major groups of drugs- Benzimidazoles (BZD), Macrolides (also called macrocyclic lactones) and a third group referred to as nicotinic agents. Recognize which products are in each group because once worms become resistant to one member of the group, they will be resistant to the other members of the group.

Chemical Name	Family	Approved for Use in Sheep?	Trade Name
Fenbendazole	BZD	No	Safeguard
Albendazole	BZD	Yes (not first 30 days pregnancy)	Valbazen
Levamisole	Nicotinic	Yes	Tramisol
Pyrantel	Nicotinic	No	Strongid T
Ivermectin	Macrolide	Yes (drench only)	Ivomec
Doramectin	Macrolide	No	Dectomax
Moxidectin	Macrolide	Yes (drench)	Cydectin

Note: Some of the drugs listed here are not FDA approved for use in sheep and, as such, can only be used following consultation with your veterinarian with appropriate consideration of withdrawal times.

- 4) Administer dewormers carefully and be certain the animal ingests the product fully.
- 5) Hold sheep off feed or pasture for 12 to 24 hours before treatment (do not hold off water, only feed). By doing so, the drugs will not pass so quickly through the GI tract, and active levels will be maintained in the body longer.
- 6) Rotate dewormers on an annual basis. To reduce the selection for resistance it is best not to use any single drug group for too long.
- 7) Avoid bringing resistance on your farm through new sheep that are purchased. Always quarantine new animals and immediately deworm them with at least 2 drug classes. Keep them separated, preferably away from any pasture, for a week until no further eggs would be passed in the manure from imported drug resistant parasites.

As suggested earlier, an important step in controlling the development of resistance is to reduce the number of deworming treatments. By reducing the number of treatments, the goal is to reduce the number of worms that are exposed to the drug and reduce their selection for resistance. One method of reducing the number of dewormings is to monitor eye color. Infection with the blood-sucking results in anemia which can be diagnosed by pale mucous membranes around the eye. A South African researcher has produced an eye color chart, called the FAMACHA system, in which sheep are checked on a regular basis and the color of the mucous membranes is checked against a chart that then directs which sheep should be treated. This system has attained popularity in the U.S. Secondly, reducing stocking density will likely reduce the number of dewormings since the parasites will effectively be spread over a larger area. Thirdly, research has demonstrated that animals on a high nutritional plane are more resistant to the adverse effects of parasites than those on marginal diets. Protein and minerals, as well as energy, are important in resisting the effects of barber pole worm because new red blood cells must be generated to replace those lost to the parasites. Using the sheep's natural immunity to parasites will also be beneficial. Levels of resistance vary with age and reproductive condition, with lambs the most susceptible and ewes in early lactation generally more susceptible than dry ewes. Concentrate worm control efforts on the sheep that need it the most (lambs). The pasture with the lowest number of parasite larvae should be used for ewes and lambs, not for rams or dry ewes. Similarly, pasture management will reduce parasite loads. Rested pastures and pastures that have been recently cut for hay generally have fewer parasites. The most susceptible animals should graze these pastures first. Grazing with cattle or horses also can be effective; as most parasites are species-specific will not infect other animal species. Lastly, consider genetic selection as a component of the parasite control program. In any population of sheep there will be some highly resistant sheep and some very susceptible sheep, which is likely related to the immune response of the animal. You should eliminate the highly susceptible animals from your flock (sheep that always develops bottle jaw before the others). Some sheep breeds, especially the Caribbean hair sheep breeds, exhibit natural resistance to gastrointestinal nematodes.

Proper Wool Handling

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Proper harvesting, packaging, and storage of the wool is important to realize the full value of the wool clip. Since wool sales represent a very small portion of the gross returns for most sheep enterprise, wholesale changes to the genetics of the flock to improve fiber diameter and fleece weight are likely not justified for most Mid-Atlantic producers. However, there are several important steps that should be considered to maximize the value of the wool clip:

A. Minimize Contamination:

1. Keep shearing area clean and free of straw/hay and other potential sources of contamination.
2. Avoid use of plastic baler twine in sheep operation that may contaminate fleeces (this contamination occurs throughout the year, not just at shearing time).

B. Use Proper Packaging Material:

1. Do not use plastic feed sacks to store or package wool.
2. Plastic film bags are available and preferred. Points to consider with plastic film bags:
 - a. Sheep need to be dry when sheared. Plastic bags will not breathe as well as jute bags (more possibility for wool to mold and rot).
 - b. Plastic film bags will tear easier when handled.
 - c. Tie plastic film bags shut in similar manner to jute bags.
3. Store wool in dry place, avoid cement or dirt floors to prevent moisture uptake.

C. Sort Wool at Shearing Time

1. Shear white-face sheep first, blackface sheep last to avoid contamination of white-faced wool with black fibers.
2. Package lamb and ewe wool separate.
3. Remove tags at shearing and discard.
4. Sort belly wool and bag separately. Also sort wool caps and leg wool out if justified.
5. Off-type fleeces (black, high vegetable matter, etc.) as well as belly wool should be packaged first in a small plastic garbage bag or paper sack. The small bag may then be added to the large polyethylene film bag. The small bag serves to keep these wools separate and prevents them from contaminating other fleeces already packaged, and results in a more uniform lot of wool.
6. Do not tie wool with paper twine.