

APSC

The Department of
Animal and Poultry Sciences

www.apsc.vt.edu

Dear Alumni and Friends:

Though a bit wet in Blacksburg this spring, the semester ended with the graduation of yet another class of outstanding young people; well-educated and looking forward to making “their mark” in the world.

I have the privilege of conducting exit interviews every spring with our seniors. If my sampling of graduates is reflective of the whole, I can state without reservation we have one of the best departments/programs across the Blacksburg campus, and perhaps across the nation. Time and time again, I hear how much our students admire this faculty, especially the amount of time they unselfishly give to advise them on myriad matters, the least of which are about the curriculum. Moreover, I hear repeatedly that our students really feel grateful for an education with a balanced blend of “book smarts” and “hands on” experience. Though the aforementioned is self-gratifying and flattering, I must recognize that these discussions are only possible because of the quality and character of our undergraduate population. To no surprise, we matriculate some of the best and brightest minds in the Commonwealth. As I have stated at our scholarship banquet over the past five years, we faculty should consider it a privilege that these young people choose to share in their learning experience with us. What a wonderful and rewarding profession we have as faculty members at a land-grant institution!

The department continues to grow. We added five faculty members to the department this past August and are in the process of hiring another two this August. We have submitted an aggressive hiring plan to the college and hope to fill two additional positions next year. If successful, this will likely get us to full capacity, after which, new hires would likely only occur with departures. Regardless, the faculty in the Department of Animal and Poultry Sciences remains strong, vibrant and committed to animal agriculture.

There is little question that we continue to face some monumental challenges, however, as do our sister institutions across the nation.

Animal programs are incredibly expensive for a university, and as such, we must be good stewards of departmental monies

and do everything possible to leverage our talents against non-traditional sources of funds for the institution. A further challenge is that facilities to handle our programs are dilapidated. As a result, our facilities are not the industry standard and thus fail to reflect the types of problems facing the industry. To address both of these issues, we will need to begin a dialogue with stakeholders, government officials and university leadership. We hope to begin that process soon with our departmental advisory board.

Even in the light of major obstacles we feel delighted to be well-positioned to provide great programs in animal agriculture science for the Commonwealth.

If you should have any thoughts or questions regarding the direction or vision of the department, don't hesitate to let me know (dgerrard@vt.edu) and most importantly, we thank you for your support and hope to see you on campus very soon.

Sincerely,



Professor and Head
Department of Animal and Poultry Sciences



*David E. Gerrard, professor
and department head*





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The Latest Cuts: Meat Center Update

The Virginia Tech Meat Center has been steadily increasing production over the years with no signs of slowing down. From harvesting university livestock, assisting classes with labs, working with department researchers, to increasing retail sales, the center's focus has been on improving a wide range of services to fit the needs of both livestock growers and meat processors across the Commonwealth.

This past year we have been able to employ between four and five undergraduate students due to our growth. These students have been involved through the entire harvesting, fabrication, and further processing components of the center. From those students whom we have employed, one is graduating and entering the meat industry with full time employment, while two others will be doing meat industry internships this summer before they return back to Blacksburg to continue their undergraduate education.

The center has also experienced an increase in retail sales due to an ongoing working relationship with Dining Services to provide local meats back to the university. These local meats are available to the public, so if Blacksburg is a convenient shopping location for you, make sure to put in your meat order from the center. Right now we are taking orders via an online ordering system that can be found on the department's web page. While the center offers typical retail cuts of beef, pork, and lamb, further processed items like

bacon, hams, and sausages are also available.

Looking to what the future holds for the Meat Center, we will be offering some freezer lambs throughout the next handful of months as we work on a joint effort with West Virginia University on some parasite research kills. The center also plans to be a part of some extension efforts that will primarily focus on harvesting or meat processing. If any of you have ideas or thoughts about future extension activity needs regarding harvesting, meat cutting, or processing, please drop us a line at the Meat Center.

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The joy of pondering with USMARC: an engaging sabbatical

Ron Lewis

Sabbatical is defined as rest from work, and the term originates from the biblical commandment to desist from working the fields in the seventh year. In a strict sense, therefore, a sabbatical lasts a year. Mine was a bit shorter, but far from fallow. It was restful and allowed me time to cultivate fresh ideas with colleagues, both old and new. It also provided opportunity for my staff, graduate students, and I to engage in scientific endeavors otherwise unavailable to us. Beyond our accomplishments achieved while at the United States Meat Animal Research Center in Nebraska, the sabbatical laid foundation for ongoing collaboration. In this article, I wish to summarize our collective joy of pondering during an engaging sabbatical.

Cow efficiency is a driver of the profitability of beef cattle systems, and depends on outputs like reproductive success (calving) and calf growth, and inputs like feed and husbandry. Mature size also contributes as it affects intake and, where choices are available, perhaps diet selection. Measuring intake and diet choice in pasture-based operations is particularly challenging. One method is based on plant-wax markers, compounds found in the cell wall of plants that can provide a “signature” of individual plants. Since these markers are largely indigestible, their concentrations in feces can be used to estimate animals’ diet compositions. Furthermore, when dosing with external wax markers, feed intakes can be assessed too. Still, the reliability of this tool depends on how well plants can be discerned, which varies depending on the botanical composition of pastures. The United States Meat Animal Research Center has both warm and cool season pastures. In cool season pastures, we sampled 17 species, a mix of legumes, grasses and other herbage. Using a single family of plant-waxes

(n-alkanes), many but not all of these species were distinguished; additional plant markers are now being used (long-chain alcohols) to better discern among them. Fecal samples were collected on cattle grazing these pastures. We predicted the average cow chooses 71% grass in its diet but with considerable variability amongst them. In order to assess the intake and diet choice of an individual, its fecal deposit must be matched to it. We considered the utility of genotyping fecal samples collected off pasture. Although imperfect, fecal samples could be correctly paired with individual cows. With some changes to the DNA extraction method, this approach has promise. Clearly refinements remain. Still, by better understanding intakes and diet preferences in cattle, it seems possible to devise better strategies to integrate animal selection programs with land management practices.



A trek of the Lewis lab (and partners) in the Appalachians. From left: first row, Megan James, Gabi Márquez Betz, Ron Lewis; second row: Joe Emenheiser, Joshua Edwards, Katherine Slaughter, Jaime Rutter, Sarah Blevins; third row: Sebastian Arriola, Napoleón Vargas Juardo. Photographer: Esti Lewis.

The mature (or metabolic) weight of a cow is often defined in terms of its live weight with some adjustment for body condition. Although ultrasound measures could contribute to that description, its use in cows is limited. A group of 87 mixed-aged cows varying in body



A Hokie Seasons Greetings, and a scrumptious thanks, to USMARC colleagues.

condition and targeted for cull were available at USMARC. Two scan technicians scanned each cow on two consecutive days. Ultrasonic back fat thickness, ribeye area and intramuscular fat were obtained, and were consistent between operators and days. Similar measures were collected on cows post-slaughter. Ultrasound measures were appreciably better indicators of carcass back fat, ribeye area and marbling score than live weight or body condition. Ultrasound therefore may provide useful information to delineate differences in mature weights among cows, and thereby their efficiency.

Copy number variants (CNVs) are structural variants in DNA that may affect expression of phenotypic traits. We undertook a genome-wide CNV analysis of 3,884 cattle with 50K single nucleotide polymorphism (SNP), feed intake and daily gain data. As a novel approach, we considered the SNP, intake and gain as ‘traits’. Using the log R ratio as our estimate of CNV at a SNP, associations among our traits were determined. Given the size of these data, these analyses were only possible because of a computationally efficient algorithm devised during the project. The CNV at a number of SNP were at least moderately heritable. Genetic correlations for CNV among some subsets of SNP were

Youth Events a Success at 2013 Virginia Beef Expo

The Virginia Beef Expo was held April 19–21, 2013 at the Rockingham County Fairgrounds in Harrisonburg, Va.. The Virginia Beef Expo serves as the host for the State Youth Cattle Working Contest, Junior Beef Roundup, and a Beef Stockmen's Contest. During the three-day expo over 200 exhibitors from across the Commonwealth participated in one or more of these events.

The State Youth Cattle Working Contest was held on Saturday, April 20. Earlier this spring, five regional contests were held in various locations across the state to determine the top ten teams that would be represented at the 2013 State Youth Cattle Working Contest. A total of 52 teams competed at the regional levels. In the Madison area, the regional contest was held at Tucker Livestock on April 3. The two teams representing the Madison area were Orange County A (Garrett Chambers, Kelly Shifflett, and John Michael Knight) and Orange County B (Robert Nixon, Zachary Swope, and Blake Hopkins). In southwest Virginia, the regional contest was held on March 29 at Gene Copenhaver's Farm in Meadowview. The two teams representing this region and moving on to the State competition were: Grayson County A represented by Richard Tre Parks, Ethan Reedy, and Jordan Roten and Grayson County B represented by Kayla Johnson, Jared Hunter, and Lucas Mitchell

From the Southern Piedmont Regional contest that was held on April 4 at the Southern Piedmont AREC, Randolph Henry FFA members Ryan Hamlett, Dottie Long, and Scott Pugh moved on to the state level. The Shenandoah AREC hosted a regional contest on April 9 and



State Youth Cattle Working Contest Champion Team, Orange County 4-H (L to R): Steve Hopkins, Orange County Extension Agent, Coach; Robert Nixon, Blake Hopkins and Zachary Swope.

sent Riverheads FFA members Weston Snyder, Cole Leonard, and Mackenza Muncy and Rockingham County 4-H members Zack Seekford, Ashley Craun, and Caroline Warns on to the State level. From the New River Valley, Pulaski County A team members Heath Sutphin, Courtney Jones, and Jennifer Jones, and from Rural Retreat (Ashton Matney, Michael Addison, and Hunter Addison) and Pulaski County B members Micah Taylor, Blake Smith, and Tori Kegley went on to compete in the State contest. The New River Valley contest was held on April 13 at G & G Livestock in Max Meadows, Va.

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 2013 State Youth Cattle Working Contest, first place was awarded to team Orange County B, which consisted of Robert Nixon, Zachary Swope and Blake Hopkins. Orange County A's members Garret Chambers, Kelly Shifflett, and John Michael Knight took home second place honors. Congratulations to all those teams that made it to the state level. A special thanks goes to Novartis Animal Health, Bayer Animal Health, Zoetis, Merck Animal Health, and Boehringer Ingelheim for their donation of products for both the regional and state contests.

The 2013 Junior Beef Roundup saw 218 exhibitors and 247 head of cattle entered in the various shows including: Angus, Braunvieh, Hereford, Short-horn, Simmental, Red Angus, All Other Breeds Heifers, Commercial Heifers, Steers, and Youth Showmanship.

The various junior breed associations managed their specific breed shows. The All Other Breeds Heifers, Commercial Heifers, Steers, and Youth Showmanship were managed by Virginia Cooperative Extension and Virginia Tech Block and Bridle. The two judges for this year's events were Judd Gardner and John Barnes. The first show of the weekend was the All Other Breeds Heifer Show held on Saturday afternoon. Kelsi Lawson, hailing from Loudoun County, won the title 'Grand Champion All Other Breeds' Heifer with her Maine-Anjou. Taylor Wright from Augusta County came in reserve with her Chimaine heifer. The commercial heifer show began bright and early Sunday morning. The coolness in the air gave the cattle a lighter step, and the excitement hung on the air. John Michael Knight from Orange County won Grand Champion Commercial Heifer, and Ben Jenkins from Page County finished with Reserve Champion Commercial Heifer. The final event of the youth shows

continued from page 4

weekend ended with the steer show. Kelsi Lawson won Grand Champion Steer with her lightweight steer, while Nicole Kibler from Shenandoah won Reserve Champion with her steer.

In addition to the State Youth Cattle Working Contest and the Junior Beef Roundup, youth in attendance could participate in a Beef Stockmen's Contest. This species-specific contest tested the youth's knowledge of beef breeds, equipment, feed, and meat identification, as well as, judging of two cattle classes (Angus Heifers, and Shorthorn Market Steers), a class of rib-eye steaks, and a class of hay. The youth also had to take a quiz on their general beef knowledge. The contest had a junior division, which consisted of youth ages 9 – 13 and a senior division for youth ages 14 – 19, as of September 30, 2013.

The Junior Division of the Beef Stockmen's contest saw 21 participants, with top honors going to Paul Craun of Rockingham County 4-H and a total score of 409. Second place was awarded to Ethan Clouse of Montgomery County 4-H with a total score of 396. Caleb Boden, Zach McCall, and Alex Wheeler also won top honors in the Junior Division.

The Senior Division of the Beef Stockmen's contest had a total of 35 individuals. This year's first place winner was awarded to Phillip Saunders of Amherst/Nelson 4-H Livestock Club. Phillip posted a score of 424. Lindsey Fenster of Rockbridge 4-H was awarded second place with a total score of 419. Top honors were also awarded to Cody Boden, Catie Hope, and Hunter Wimmer.

Students gather in Columbus for Undergraduate Equine Research Symposium

More than 50 students, including 20 from Virginia Tech, gathered in Columbus, Ohio., on March 22 and 23 for the Third Annual Undergraduate Equine Research Symposium. The event, which began in 2011 at the Virginia Tech Middleburg Agricultural Research and Extension Center, is the only one of its kind created specifically for undergraduate students. Designed to foster a collaborative atmosphere of scientific discovery and sharing among students with a passion for the health and wellbeing of the horse, the program consisted of student presentations of current research at several institutions, tours of the Ohio State equine and veterinary facilities, and instructional wet labs where students gained hands-on knowledge and research skills through lower limb dissections, PCR, uterine cytology, ultrasonography and more.

As an added bonus, a special day of research activities was scheduled at the center for Virginia Tech students the day before they left for the symposium. Faculty, graduate students and current spring semester interns helped the Blacksburg crew learn more about this unique research facility and its opportunities for student discovery. After a tour of the facilities, the group participated in various labs, including a demonstration of the high-speed equine treadmill, fecal egg count analysis, stallion semen analysis using

a state-of-the-art computerized semen analysis system, ultrasound on an in-utero foal, and a 'mini-experiment' in which students explored various blood parameters before and after exercise.

Overall, this trip was an invaluable learning experience for the Middleburg Agricultural Research and Extension Center interns and visiting Virginia Tech undergrads, and provided a great opportunity to network with other undergraduates, veterinarians, and equine scientists engaged in research to benefit the horse and the equine industries.



The joy of pondering with USMARC: an engaging sabbatical – continued from page 3

also high; such regions of the cattle genome therefore may be of interest for further investigation. In addition, we identified genetic associations between CNV at some SNP and feed intake and daily gain. Although work remains, these initial findings are promising.

These activities, all of which contribute to our understanding of cattle efficiency, entailed close involvement of my team at Virginia Tech with many scientists and staff at USMARC. In particular, I thank Gary Bennett, Linda Flathman, Harvey Freetly, Heidi Hillhouse, John Keele, Larry Kuehn, Amanda Lindholm-Perry, Sam Nejezchleb, John Pollak, Steven Shackelford, J R Tait, and Tommy Wheeler. Our accomplishments reflect our interactions. It also made my sabbatical a joyful and engaging pondering.

2013 State Stockmen's and 4-H Quiz Bowl Competitions Held

The 2013 State Junior Stockmen's Contest and State 4-H Quiz Bowl Competition were held on April 5, 2013 at Augusta Expoland in Fishersville, Va. These two state-level competitions drew over 280 4-H and Future Farmers of America youth from across the Commonwealth.

The 2013 Junior Stockmen's Contest consisted of 123 junior and 160 senior competitors who are in the 4-H or Future Farmers of America programs. The contest consists of a livestock specific quiz, identification of livestock equipment, breeds, feeds, and meat, judging of live cattle, sheep, and swine, as well as questions on each of those classes, and judging of meats and hay. The winning senior team will go on to compete at the National 4-H Stockmen's Contest that will be held later this fall. This year's winners are from Rockbridge County 4-H. Team members include: Will Strecker, Lindsey Fenster, Brandon Hamilton, and Michael Roney. In addition to Rockbridge, a congratulations goes out to our top five senior teams, Carroll County 4-H, Washington County 4-H, Orange County 4-H, and Augusta County 4-H. The top five senior individuals were: 1st Place – Kate Belcher (Washington County), 2nd Place – Claire Gleason (Carroll County), 3rd Place – Lindsey Fenster (Rockbridge County), 4th Place – Cole Leonard (Riverheads FFA) and 5th Place – Robert Nixon

(Orange County). Top honors were also awarded in the junior division, which consists of youth ages 9–13. The top five teams were (in descending order) – Augusta County 4-H, Rockingham County 4-H, Rockbridge County 4-H, Pittsylvania County 4-H and Orange County 4-H. The top five junior individuals were: 1st Place – Bailey Hadacek (Augusta County), 2nd Place – Camille Mitchell (Chesapeake), 3rd Place – Caleb Boden (Frederick County), 4th Place – Abigail Durham (Stafford County) and 5th Place – Colton Buchanan (Augusta County). The first annual State 4-H Livestock Quiz Bowl Competition was held in conjunction with the State Junior Stockmen's Competition. This competition was open to 4-H teams across the state. The Quiz Bowl drew 18 junior teams and 19 senior teams to the inaugural event. Competitors were asked individual one-on-one questions, team questions, and the fun toss-up questions that were open to anyone. Each round lasted approximately 15 minutes and consisted of general livestock questions. The First Place Team will

compete at the National 4-H Livestock Quiz Bowl Invitational on September 28, 2013 during the Ak-Sar-Ben 4-H Stock Show. This year's winning team is Carroll County 4-H Livestock Club and the winning team members are Jessica Vass, Abigail Williams, Claire Gleason, and Jeffery Vass. The 2nd Place team will go on to compete at the Ak-Sar-Ben Livestock Quiz Bowl Contest to be held on September 28th. The 2nd Place team was Augusta County 4-H and consisted of Coffman Liggett, Jessica Houff, Shannon Garber, Ben Goad, and Madison Slaven. Additional honors went to the 1st place Junior Team, Augusta County 4-H (Cassie Simmons, Bailey Hadacek, Colton Buchanan, and Mikala Liptrap) and 2nd place to Orange County 4-H (Marlaina Johnson, Autumn Rogers, Stella Bradford, Case Norford, and Garrett Hopkins).

All contest results and additional 4-H Livestock information can be found on the 4-H Youth Livestock website at www.ext.vt.edu/youthlivestock.

The Third Annual APSC Research Symposium

By Rami Dalloul

On behalf of the Symposium Committee, we thank all participants and attendees of our Third Annual APSC Research Symposium (Spring 2013) for a great turnout. It was again a wonderful learning experience and an enjoyable event! We convey sincere thanks to Dave Gerrard for his sponsorship, and certainly to Ellie Stephens and all her helpers for providing the ancillary support and wonderful luncheon.

All presenters were provided with valuable feedback from both judges and curious attendees. The presenters listed below will be awarded up to \$500 in travel money in support of their participation at scientific meetings during this coming year. The amount will be in the form of travel reimbursement.

Please note that there is no ranking, names are listed in alphabetical order.

Poster session: Leanne Brooks
Chasity Cox
Sarah McCoski
Jason Smith

Oral session: Gabi Márquez Betz
Wei (Lacey) Zhang

Non-graduate students: Sungwon Kim

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Yes No

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