Texas Aggie Poultry
A newsletter from the Department of Poultry Science at Texas A&M University

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Department of Poultry Science welcomes new faculty

Dr. Audrey McElroy joined the Department of Poultry Science on Sept. 1, 2014 as a Professor and Extension Specialist.

Prior to joining Texas A&M, McElroy worked as a faculty member in the Department of Animal and Poultry Sciences at Virginia Tech since 1999 where she taught undergraduate courses, conducted research and provided extension programming for the Virginia poultry industry. In 2010, she was awarded a College of Agriculture and Life Sciences Certificate of Teaching Excellence at Virginia Tech, and in 2011, she was honored by the Poultry Science Association with the Novus International Teaching Award.

Her research has focused on intestinal health issues in poultry such as coccidiosis and necrotic enteritis with the goal of minimizing the impact of these diseases on growth and performance in broilers and turkeys. In addition to working with the commercial poultry industry on problem solving and research directly related to her specific areas, she provided leadership for the annual Virginia Poultry Health and Management meeting and was responsible for the Virginia commercial poultry biosecurity audit program.

Her extension programming in Texas will continue such work with the commercial broiler and turkey industries, including coordinating the Texas Broiler Symposium.

She served on the Poultry Science Association Board of Directors from 2012-2014, as a member of the Nominating Committee, the Phibro Extension Award Selection Committee, and Chair of the Frank Perdue Live Poultry Food Safety Committee. Other service includes serving as President of the Southern Poultry Science Society from 2008-2009.

A native of Texas, McElroy earned her bachelor’s, master’s and doctorate degrees in Poultry Science from Texas A&M University.

The Department of Poultry Science welcomed Dr. Giridhar Athrey as an Assistant Professor of Avian Genetics and Functional Genomics on Jan. 1, 2015.

Athrey previously worked as a postdoctoral research associate in the Department of Entomology at Texas A&M University focusing on the genomics of infectious disease vector mosquitoes.

He received his B.Sc Honours in Genetics from Bangalore University, India. He then earned master’s and doctorate degrees in Evolutionary and Environmental Biology from the University of Louisiana at Lafayette. His doctoral research focused on the population genetics of non-game songbird species in the Texas Hill Country.

In 2013, he received the Young Investigator Award from the American Society for Tropical Medicine & Hygiene. He is also currently serving as a scientific advisor to the Revive & Restore Foundation, which aims to use genomic technologies to revive endangered and extinct bird species.

The main focus of his research addresses fundamental questions relevant to genomics, evolution and conservation of both domesticated and wild bird species. The broader implications of his research include the generation of knowledge and innovative tools for improving animal, human and environmental health. Current priorities for research are to investigate immune modulation by gut microbiota, using comparative studies to understand the genetic basis of quantitative traits, and to improve the chicken genome assembly.

Athrey is excited about mentoring and training students to help develop poultry geneticists of the future. He is also looking forward to working with colleagues and the poultry industry to apply genomic tools to tackle problems that are impacting poultry.
A message from the Department Head

By Dr. David Caldwell

Howdy! Welcome to the second edition of our newsletter, Texas Aggie Poultry. First and foremost, I would like to thank Dr. Craig Coufal for his oversight, organization and distribution of this newsletter. As a department, we received a great deal of positive feedback on the first edition. We are committed to making sure that the newsletter accurately communicates to our stakeholders, former students, and friends of the department the current events and successes achieved within the Department of Poultry Science.

We have enjoyed a very productive academic year so far. A total of 27 undergraduate students received diplomas in 2014. While this number is lower than what we reported for 2013, approximately 80 percent of our graduates accepted offers for full-time employment in the commercial poultry industry. We are scheduled to graduate 37 students in the May 2015 commencement ceremony.

Earlier this year, we were very fortunate to receive a grant from the U.S. Poultry and Egg Association’s Harold E. Ford Foundation in the amount of $38,178. These funds are used throughout the year to sponsor academic programs that involve new student recruitment and career preparation or development. The primary sponsor of our funding this year was Tyson Foods. I would like express a huge thank you to Tyson Foods and Cobb-Vantress for their continued support of our department.

Our Extension unit welcomed a new faculty member, Dr. Audrey McElroy, on Sept. 1, 2014. Currently, Drs. Coufal, Greg Archer and McElroy are busy interacting with industry stakeholders and making preparations for the upcoming Texas Commercial Egg Clinic in April.

On Jan. 1, 2015, we also welcomed Dr. Giri Athrey to the department. Dr. Athrey is a functional genomicist/geneticist and is currently working diligently to get his research program organized and off the ground. He is also assisting with the instruction of our undergraduate Avian Genetics course. In addition, we are currently conducting a search for a new faculty member to focus on research and teaching programs in the field of avian physiology.

In summary, we have many things to be proud of in our department. In this edition of Texas Aggie Poultry, you will read about many specific examples of our successful programs, which are made possible by the dedication and commitment of our outstanding faculty, staff and students. I hope you enjoy the newsletter and please reach out to me directly if we can be of assistance in any way.

Poultry Judging Team wins ninth consecutive National Championship

The Texas A&M University Poultry Judging Team won their ninth consecutive national championship at the 2014 National Collegiate Poultry Judging Contest held in Fayetteville, Ark., on Nov. 3-4. Seven teams from across the nation competed in the two-day competition which was hosted by the University of Arkansas.

The team placed first in the Breeder and Carcass Quality Division and third in the Egg Production and Quality Division.

Team members are Kolton Page (3rd place, breeder and carcass quality division and 3rd overall high individual), Jill Wright (2nd place breeder and carcass quality division and 4th overall high individual), Katie Bennett (5th overall high individual), and Brooke Bodle (8th overall high individual).

The team is coached by Dr. Jason Lee and assistant coaches Jake Pieniazek and Jacob Price. Congratulations to the team!

Front left, Kolton Page, Jill Wright, Katie Bennett and Brooke Bodle. Back left, Jake Pieniazek, Jacob Price and Jason Lee.
eBeam Center receives special recognition

The National Center for Electron Beam Research was formally designated as an IAEA Collaborating Center for Electron Beam (eBeam) technologies for food, health and environment.

The event was marked by a plaque dedication ceremony that involved H.E. Ambassador Yukia Amano, Director General of the International Atomic Energy Agency (IAEA) presenting the plaque to Dr. Suresh Pillai, eBeam Center Director. Also in attendance was leadership from the Texas A&M University System and Texas A&M University including Chancellor John Sharp; Dr. Mark Hussey, Texas A&M Interim President; Dr. Bill Dugas, Acting Dean and Vice Chancellor; and Dr. Craig Nessler, Director of AgriLife Research.

The IAEA Collaborating Center provides the eBeam center global recognition and opportunities to make improvements in food safety, food quality, food security, environment and public health.

Salmonella vaccine developed using eBeam technology

The National Center for Electron Beam Research and USDA-ARS have jointly developed an eBeam-based vaccine against *Salmonella* in poultry. The hypothesis of the research was that electron beam (eBeam) inactivated *Salmonella enterica* serovar Enteritidis (SE) cells can serve as a vaccine to control SE colonization and shedding in chickens. The research showed that eBeam-based SE vaccines are immunogenic and are capable of protecting chickens against SE colonization. The eBeam-based vaccine technology is non-thermal, avoids the use of formalin, and can be rapidly employed to develop customized vaccines for addressing strain specific infections in farms or flocks.

Research fund established in Dr. John Carey’s honor

The Jones-Hamilton Company has established a fund in the Department of Poultry Science in Dr. John Carey’s name to support research and other faculty endeavors overseen by him. The Dr. John Carey Excellence Fund represents a $50,000 donation to the department.

Congratulations to Dr. Carey on this very prestigious honor.

New eBeam technology book published

Dr. Suresh Pillai and his graduate student Shima Shayanfar recently edited a book titled, *Electron Beam Pasteurization and Complementary Food Processing Technologies*. This book, which is the first of its type in terms of its focus on eBeam food processing technology, has 16 chapters with authors from all corners of the world. Dr. Pillai and Shima have also given several presentations at international meetings about their work at the eBeam Center. Congratulations Dr. Pillai and Shima!
Undergrads attend IPPE College Student Careers Program

A group of 21 junior and senior undergraduate students majoring in Poultry Science recently traveled to the 2015 International Production and Processing Exposition held in Atlanta, Ga., to participate in the Harold E. Ford Foundation’s College Student Careers Program.

The event is organized by the Ford Foundation and USPOULTRY each year to allow college juniors and seniors from universities across the U.S. to interview with companies from the commercial poultry industry for summer internships or full time positions. The majority of the Texas A&M students attending this year received offers on site for summer internships or full time positions following graduation.

Tyson Foods and Feather Crest Farms of Kurten, Texas, provided funding to offset travel expenses for the Texas A&M students to attend. This support is greatly appreciated as it allowed the students to participate in an important career-oriented event.

Students win awards at the International Poultry Science Forum

Many faculty, staff and students in the Department of Poultry Science attended the 2015 International Poultry Science Forum held during the International Production and Processing Exposition in Atlanta, Ga., on Jan. 26-29, 2015.

Tucker Allcorn and Hunter Walters received Student Research Paper Certificates of Excellence for presenting high-quality research papers at the annual meeting. Both presentations were submitted in the Nutrition and Metabolism section and involved the use of various enzymes on broiler performance. Tucker's presentation was titled “Evaluation of multiple levels of phytase and non-phytase enzyme inclusion on broiler growth performance”, and Hunter's presentation was titled “Evaluation of NSPase inclusion in diets manufactured with high and low quality corn on male broilers”. Tucker is a master’s student and Hunter is an undergraduate student, both working under the direction of Dr. Jason Lee.

Register now for 2015 Poultry Institute for Youth

The Texas A&M Department of Poultry Science along with the U.S. Poultry and Egg Association are sponsoring the 2015 TAMU Poultry Institute for Youth scheduled for June 14-16, 2015.

The purpose for this program is to give high school students a chance to learn about the poultry industry through hands-on activities. The participants will have the opportunity to meet Texas A&M University staff as well as leaders from the poultry industry. A portion of the institute will consist of hands-on experience by working with poultry directly as well as visiting poultry facilities.

The application can be found online at http://posc.tamu.edu/files/2012/08/2015-TAMU-Poultry-Institute-for-Youth-Application.pdf. For more information, please contact Allison Moore at allison.moore@ag.tamu.edu or 979-845-1654.
Department receives $38,178 student recruitment grant from US Poultry and Tyson Foods

The Department of Poultry Science recently received a $38,178 student recruitment grant from the US Poultry and Egg Association’s Harold E. Ford Foundation. The grant was made possible by a gift from Tyson Foods. The check was presented to Dr. David Caldwell by Tyson Foods’ nutritionists Roy Brister and Bill Johnson. Joining in the presentation were current undergraduate students Austin Jasek, Hunter Walters, Brooke Bodle and Alex Williamson.

“We plan to strengthen existing recruiting programs and identify new and creative methods for generating interest in poultry science among potential applicants. The overarching goal of our academic program is to recruit, retain and graduate the best and brightest students possible for long-term contributions to the commercial and allied industries. We greatly appreciate the continued support of our department and students by the USPOULTRY Foundation as we attempt to accomplish this goal,” said Dr. Caldwell.

Poultry Science student recognized by Texas A&M AgriLife

The academic and extra-curricular accomplishments of Timothy Broderick, a senior Poultry and Animal Sciences double major, was highlighted in an article on the Texas A&M AgriLife website. Not only is Timothy an outstanding student in the classroom, he excels in activities outside the classroom as well. Timothy was a member of the Poultry Judging Team, is currently serving as an officer on the COALS Council, and is conducting undergraduate research in the laboratory of Dr. Tri Duong in the Poultry Science Department. View the story at http://aglifesciences.tamu.edu/blog/2014/11/26/students-involvement-with-poultry-animal-science-drives-him-to-give-back-to-the-agricultural-community-someday/.

Students visit Cal-Maine Foods

Dr. Craig Coufal’s Commercial Egg Industry class took a field trip to the south Texas egg production facilities of Cal-Maine Foods, Inc. in November. The students enjoyed touring the facilities and learning first-hand about egg production and processing from the Cal-Maine management. They were also very excited about getting some samples to take home! Thank you very much to Cal-Maine for hosting the class.
By Justin Fowler, Ph.D.

The inclusion of naturally mined clays (such as bentonites) as aflatoxin binders in animal feeds has been shown through recent decades of research to have significant protective effects against aflatoxicosis in a variety of species. These clay-based binders are generally recognized as safe (GRAS) to be used in diets for improved flowability, anti-caking, and pellet quality. However, no adsorbent has been approved by the Food and Drug Administration (FDA) for the prevention or treatment of aflatoxicosis. Concerns over the deposition of the toxin in edible tissues (such as milk, muscle, liver, or eggs) are a part of the reason why.

In a study conducted to evaluate the accumulation of aflatoxin B1 residues in the liver tissue of broiler chickens fed a range of aflatoxin (0, 600, 1200, and 1800 ppb) with and without a calcium bentonite clay, we found that 0.2% of the clay effectively reduced the accumulation of aflatoxin B1 during the first week. However, once birds had been consuming aflatoxin for three weeks, the only treatment that had detectable residues in the liver were those from the 1800 ppb treatment with no added clay, suggesting that as the birds aged their capacity to metabolize aflatoxin had become efficient enough that residues no longer accumulated. Also, the birds required only one week on a “clearance diet” containing non-contaminated corn for there to be no detectable levels of aflatoxin in the liver.

This research has highlighted the time-factor associated with the effect that aflatoxin has in broilers. We have seen that very young birds can be considered quite robust against acute doses if they are only fed contaminated diets for a very short period of time. Also, it may be that short, punctuated exposures (of approximately one week) to levels of aflatoxin above the regulatory level of 20 ppb can be acceptable, so long as that exposure is followed by at least a week of a withdrawal period on a diet free of aflatoxin. Research into these areas can help us identify alternate strategies for managing aflatoxicosis, relative to the current strategy of simply diluting aflatoxin concentrations throughout the lifetime of the bird.

Undergraduate research programs expanding

The Department of Poultry Science has always prided itself on assisting and providing experiential learning opportunities for undergraduate students to include field trips, internships and leadership opportunities. Recently, the Department of Poultry Science put forth a concerted effort to extend this to include the opportunity for students to participate in undergraduate research through the support of ACTION 2015, provided by the College of Agriculture and Life Sciences.

In the past three years, over 40 undergraduate students have completed research projects under the supervision and guidance of 10 faculty members with several of these students participating in multiple semesters. To date, 13 students have presented their research projects at national scientific meeting to include the Poultry Science Association Annual Meeting and the International Poultry Scientific Forum, with four of these presentations being recognized as outstanding research presentations.

These experiences are valuable to undergraduate students regardless of career path. Many of these students have accepted industry positions following their undergraduate career while others have entered graduate school. The department looks forward to continued expansion of this program and encourages all current students to consider this excellent opportunity.

Research Expenditures at Poultry Center exceed $1 Million in 2014

Faculty research programs at the Poultry Science Research, Teaching, and Extension Center collectively achieved a milestone by attracting more than $1 million in external funding during 2014. The success of our faculty research programs is due in large part to recent renovations made at the Center.

Over the past three years, significant renovations to the feed mill and floor-pen rearing facilities have been very well received by research sponsors. We plan to further develop this trend of success for our faculty, staff, and students by continuing to invest and build infrastructure for our research, teaching, and extension missions. Current efforts include a significant upgrade of our table egg facility and renovation or remodeling of our first and further processing facilities. Future renovation will target breeder and incubation facilities as well as isolation facilities for pathogen challenge studies.
Hatching egg sanitization process showing positive results

By Craig Coufal, Ph.D.

After several years of research, a highly effective and commercially feasible approach to hatching egg sanitization is yielding promising results. The process involves misting the eggs with a dilute hydrogen peroxide solution followed by exposure to UV light. As the UV light interacts with the hydrogen peroxide, a process known as photolysis splits the hydrogen peroxide molecule to generate hydroxide ions (OH⁻). These ions are extremely reactive and only exist for fractions of a second before reacting with other materials. In the case of eggs, the hydroxide ions react with the microorganisms on the shell, causing cellular damage and inactivating them. Research has indicated that this process occurs almost instantaneously, thus allowing for the mechanization of the process to treat hatching eggs in a rapid manner.

Following development of the process, the first commercial prototype egg sanitization machine was produced in June, 2013. Since then, several field trials at commercial operations have been conducted to evaluate the system. In total, over 500,000 eggs have been treated with the egg sanitization machines, and results indicate consistent improvements in chick quality and 7-day chick mortality.

The hydrogen peroxide and UV light process has the potential to meet all the criteria needed to be successfully implemented in the poultry industry. The process is rapid, easy to apply, cost effective, yields high microbial reductions, is safe for workers and the environment, and research data indicates there are no adverse effects to shell quality or the embryo.

Most eggs passing through the egg sanitization machine yield zero egg-shell microbial counts, and the few eggs that do not have zero counts are very low. The user simply places the eggs on the conveyor, they go through the machine, and exit in about one minute. The eggs can be placed directly on the conveyor itself or plastic incubator flats of eggs can be placed on the conveyor and passed through the machine. The ability to treat eggs on the incubator flats greatly expedites the process and reduces the amount of labor needed.

The reality is that many companies do not sanitize hatching eggs before they enter the hatcher. This leads to a continual direct source of microorganism contamination to the hatchery environment. Once there, the incubators and hatchers provide a highly favorable environment for microbial survival and contamination of newly hatched chicks.

Experiments have shown that only a few eggs contaminated with Salmonella are needed to result in almost all of the chicks in a hatcher being colonized with Salmonella at hatch time. Other studies have shown that the Salmonella serotypes found on broiler carcasses at processing are the same serotypes that can be found at hatcheries and in breeder flocks. If chicks are contaminated with pathogens before they ever leave the hatchery, then intervention strategies at the farms and processing plant will be put to the test to control pathogens such as Salmonella. Therefore, a way to sanitize hatching eggs prior to incubation and reduce the potential for pathogen transfer at the hatchery could have important implications for the poultry industry.

Theoretically, if all the eggs entering a hatchery had little microbial contamination, it is likely that overall hatchery sanitation would be improved and chick contamination might be reduced. In addition, the chicks destined to become processed for meat would have less microbial contamination starting from day one.

Commercialization of the egg sanitization equipment has begun and small units suited for use on breeder farms are available. The equipment could also be scaled-up to treat the larger volumes of eggs at the hatchery if that was preferred. While acceptable results have been obtained by treating the eggs at the hatchery, the greatest improvements in hatch, chick quality and 7-day mortality have been seen when the eggs are treated at the breeder farm immediately after collection and before the eggs are placed in the farm cooler. Whether applied at the farm or the hatchery, the process will result in eggs with lower microbial counts being placed in the incubator.
The annual Poultry Science Weekend was held Oct. 17-18, 2014. The weekend kicked off with the Steak Fry dinner held at Brian Bachmann Park. The Cargill Cooking Team once again cooked up some fantastic steaks. Special thanks go out to Wesley Carter and his team for doing a great job. A skeet shoot was held on Saturday morning followed by a football game watching party at Dale Hyatt’s ranch. Even though the outcome of the football game was not as hoped, everyone had a good time. Thanks to Dale for hosting!

Thank You Poultry Science Weekend Sponsors!