

*having the*  
**PIECES**  
*in place to*  
**SUCCEED**



2004  
2005



DALE  
**BUMPERS COLLEGE**  
of AGRICULTURAL, FOOD AND LIFE SCIENCES

**UofA** UNIVERSITY OF ARKANSAS  
DIVISION OF AGRICULTURE





THE CENTER OF EXCELLENCE FOR POULTRY SCIENCE ANNUAL REPORT  
UNIVERSITY OF ARKANSAS • DIVISION OF AGRICULTURE 2004-2005

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**DR. WALTER BOTTJE**  
Center Director

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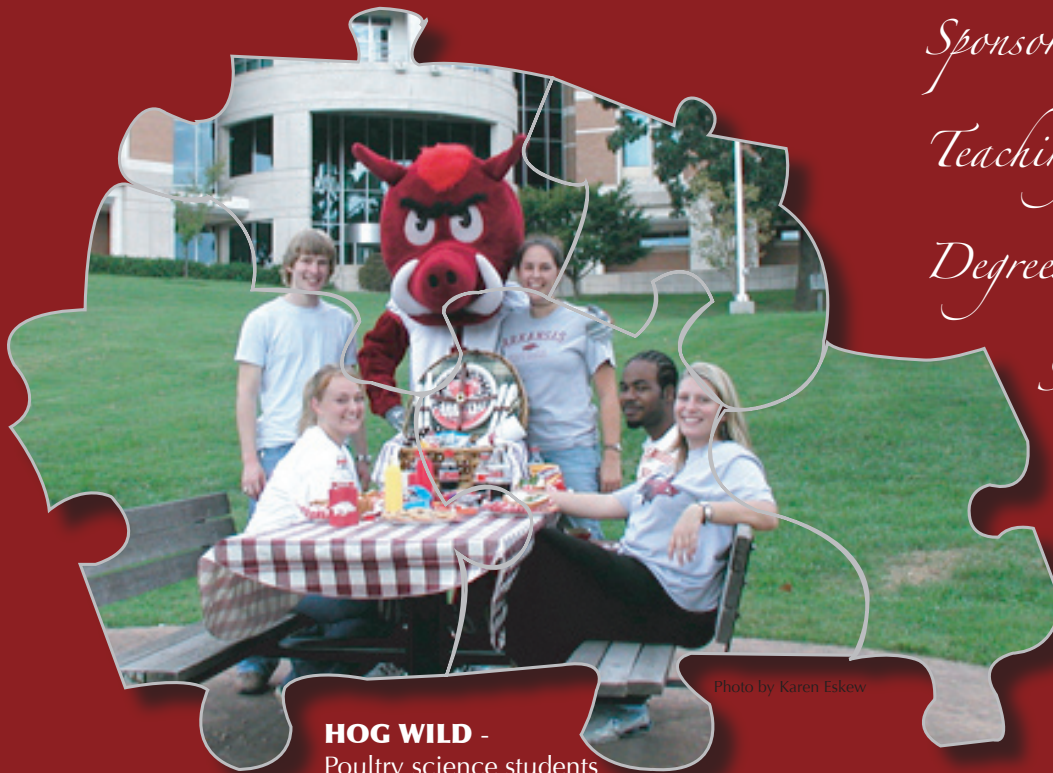


Photo by Karen Eskew

**HOG WILD** - Poultry science students gather on the front lawn for a picnic with Big Red, the mascot of the Razorbacks.

## *director's* MESSAGE

The cover of this year's annual report, "Having the Pieces in Place to Succeed," shows how we have strategically taken resources and put them in place in order to achieve success in our program.

During the 2004-2005 academic year, we underwent a major departmental review by external reviewers. It was obvious from the final report, our program has already achieved tremendous success in areas of research, extension and teaching.

There were suggestions made by the reviewers that I am currently implementing in order to enhance our program and continue to keep it the "best in the nation."

Our faculty, staff and students are the backbone to our program and supply the most critical pieces needed for our success. Their excellence and dedication have been very evident this past year when you take a look at some of the awards they have received.

One of our students, Drew Parker, was named poultry science "Student of the Year" by U.S. Poultry and Egg. One of our Extension specialists, Jerry Wooley, was named "Specialist of the Year" for Arkansas. And emeritus faculty member, Dr. Joe Beasley, was honored by being named "Arkansas Veterinarian of the Year."

Dr. Gisela Erf received the Jack G. Justus Endowment for Teaching Excellence during the 2005 Bumpers College Honors Convocation and Dr. Jason Emmert was awarded the Poultry Federation Endowed Chair. Dr. John

Kirby received the Outstanding Faculty Award from the Student Alumni Board and Associate Student Government.

In the fall of 2004, our UA poultry judging team was named the very best in the nation during the National Collegiate Poultry Judging Contest when they won first place.

And even the poultry science graduate student organization took home the 2005 Outstanding Service Project of the Year award from the Registered Student Organization on campus.

Our people, our programs and our organizations continue to be awarded and adulated on campus, around the state and even across the nation. Dr. Memo Tellez, UA research faculty member, was awarded the highest honor in Mexico for his career work during the Mexican Poultry Science Association (ANECA's) annual meeting.

Yes, 2004-2005 was a "banner" year for awards, and I am looking forward to what the rest of 2005 and 2006 hold in store for us at the Center.

Let me close by thanking our partners in the poultry industry. It is on your steady shoulders that we stand. It is because of your continued support that we keep adding more pieces to our puzzle of success. I wish everyone a successful and blessed 2006!



Dr. Walter Bottje, Director  
Center of Excellence for  
Poultry Science



# research HIGHLIGHTS

## Detecting foodborne pathogens in poultry

Dr. Yanbin Li and his research laboratory have developed an immuno-electrochemical biosensor to detect *Salmonella typhimurium*, one of the leading causes of foodborne illness, in poultry products.

Dr. Li's results indicated that these biosensors are rapid, specific, simple, portable and inexpensive in detection of foodborne pathogens. Microelectrodes, microfluidics, magnetic nanoparticles and nanocrystal markers are currently being studied for their applications in these biosensors.

Dr. Li has initiated a research with Chinese collaborators to study a nanotechnology-based biosensor for screening of avian flu viruses. The biosensor research was supported by USDA/NRI, USDA/FAS, ABI and the Food Safety Consortium. For the past year, they have four U.S. patents pending and nine refereed articles published. They currently cooperate with BioDetection Instruments, LLC for technology transfer based on NSF/SBIR and NIH/SBIR phase II projects and NSF/STTR phase I project.

Dr. Li's team is also developing an immuno-optical biosensor for rapid screening of proteins linked to feed efficiency of breeder

chickens in collaboration with Dr. Walter Bottje's team, that if successful may be able to detect proteins in blood samples in less than 30 minutes.

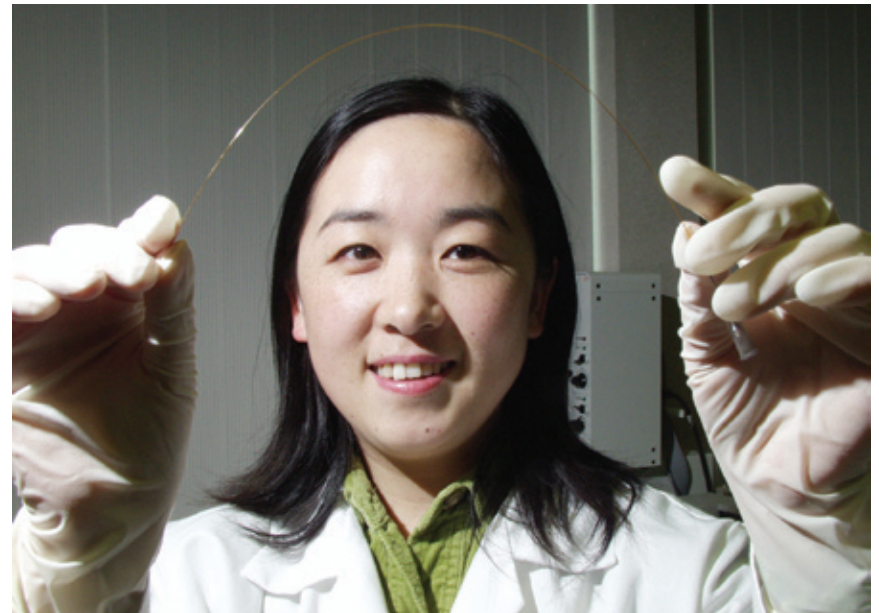


Photo by Fred Miller

**BIOSENSOR** - UA research specialist Zhenyu Zheng holds up a capillary column used as an electrochemical sensor to detect harmful bacteria in food products. Such sensors promise to speed up detection of harmful bacteria in food processing industries.

## Guidelines for evaluating coccidiosis vaccines in poultry

Coccidiosis is the most prevalent disease of poultry and millions of dollars are spent every year on medication. In recent years the use of drugs in animal feeds has come under close scrutiny and in some countries they have been banned from use. There is a need, therefore for alternative methods to control this disease.

Dr. H. David Chapman assembled an international team of independent experts to develop guidelines to assist researchers in the design, implementation, and interpretation of studies for the assessment of the efficacy and safety of live coccidiosis vaccines, and to indicate standards for manufacture and quality control. The guidelines are intended to help researchers obtain specific information for those involved in decision making processes and to facilitate the worldwide adoption of consistent, standard procedures. They provide information on general requirements of regulatory authorities based upon regulations currently applicable in the European Union and the U.S. Some of the topics covered include safety and environmental considerations, quality control, potency, stability, manufacturing practice, and last but not least, documentation.



Dr. H. David Chapman

In the foreseeable future new coccidiosis vaccines will be introduced in the U.S. Some will be produced by companies with an established vaccine track record but others, lacking such experience, are also likely to be involved. It is important that all vaccines, whatever their source, are produced to the same high standards. For example, in the U.S. source flocks used to produce poultry vaccines must be tested to ensure freedom from at least 11 kinds of virus not to mention *Mycoplasma* and *Salmonella* species. These guidelines will facilitate the worldwide adoption of consistent, standard procedures for evaluating coccidiosis vaccines for poultry.

## Antioxidants and Cancer

Health benefits of antioxidants in certain fruits, vegetables and other plants have been documented, but much remains to be learned about these compounds. Dr. John Kirby is the leader of a Division of Agriculture project to identify the mechanisms of action of certain antioxidants on the growth and development of certain cancers.

The researchers have observed effects of selected antioxidants on cell proliferation over a wide range of treatment doses, from high pharmacological doses to near physiological levels. Using high-density gene chips (DNA microarrays), the global pattern of gene expression has been evaluated. Work is underway to identify specific gene targets that will provide a representative cross section of specific metabolic and signaling pathways affected by treatment.

Among other benefits, the results will help plant breeders select cultivars with high levels of antioxidants known to provide specific health benefits.



Photo courtesy of USDA-ARS

**FIGHTING CANCER** - These vegetables are examples of the types of foods being researched in the fight against cancer. Dr. John Kirby is heading up the project.



## Improving dietary phosphorus use in chickens and reducing dietary costs

Dr. Emmert continued work on the efficacy of phytase in improving dietary phosphorus utilization in broiler chickens. Efforts over the past year focused on ensuring that the use of phytase would not impact bone strength, particularly during processing.

Emmert's lab also continued their work in the area of phase-feeding, which is a precision nutrition program designed to reduce dietary costs without compromising growth performance, uniformity, and carcass yield. Results continue to indicate that substantial savings may be possible through the use of phase-feeding techniques.

Additionally, sulfur amino acid requirements for commercial broilers and two slower-growing strains of broilers were tested by Drs. Emmert and Owens labs in order to determine the suitability of the alternative genotypes for outdoor production systems. Trials indicated that the amino acid requirements of the three genotypes were fairly similar, although the alternative genotypes exhibit slower and less efficient growth, and have considerably lower meat yield.

## Comparison of fast- and slow-growing broilers on meat quality

Few scientific studies have been conducted to compare meat yield, composition, and quality of fast-growing commercial and slow-growing alternative breeds of broiler chickens.

Under the guidance of Dr. Casey Owens, doctoral student Anne Fanatico has conducted multiple projects to evaluate field performance, meat yield, and meat quality of fast-growing commercial broiler chickens and slower-growing meat type chickens of alternative breeds.

Growth, meat yield, meat composition, and quality characteristics have been largely unaffected by outdoor access, but the fast-growing commercial breed has exhibited superior meat yield and quality compared to the slow-growing breed. The fast-growing birds had higher breast yield, while the slow-growing birds exhibit a higher wing and leg yield as a percent of body weight. Slow-growing chickens showed more foraging activity, and in fact the meat and skin of the slow-growing birds were more yellow when the birds had outdoor access; however, color was not affected in the fast-growing birds by outdoor access.

When comparing meat tenderness of slow- and fast-growing birds, the results have varied and further research is needed to understand the impact of breed and production system on meat quality.



Photo by Casey Owens

**MEAT QUALITY** - A University of Arkansas researcher is shown evaluating tenderness by using the razor blade method (known as the Meullenet Owens Razor Shear or MORS method) to shear through cooked broiler breast meat.

## Smyth line chickens as a model for human pigmentation disorders

Techniques and approaches developed as part of the vitiligo research have found direct application in research on fundamental functions of the immune system in poultry, especially cell-mediated and innate immunity, immunopathology of ascites, and studies on the interactions between the immune system, environmental factors and nutrition.

Dr. Gisela Erf has received funding from the National Institutes of Health (NIH) to continue her work on autoimmune vitiligo in the Smyth line chicken. The title of the project is “Autoimmune Vitiligo: Gene-expression during Pathogenesis.”

The mutant Smyth line and control lines of chicken is the

only animal model for the human pigmentation disorder vitiligo. Although research on the Smyth line chicken clearly established the disorder as an autoimmune disease, where the immune system is killing the chicken’s own pigment cells, this was only recently accepted as the underlying mechanism in the human disease. Hence, the work conducted on the Smyth line chicken finds direct application in understanding vitiligo and other autoimmune diseases.

Moreover, with the chicken genome sequence complete, poultry immunology finally has a real competitive edge in the field of immunology and biomedical research. For the current NIH-project, state of the art molecular approaches and tools are used that are in line with studies conducted in human immunology and pathogenesis. Currently, Nicholas Tinsley, a Master student is conducting proteomics research to identify potential abnormalities in the Smyth line pigment cells. Bryan Plumlee, a Ph.D. student, is conducting molecular biology research on identifying factors released in the local pigment cell environment that lead to the initiation and progression of an immune response against the pigment cells.

More recently, a team of researchers at the University of Uppsala in Sweden are conducting molecular genetic analyses to determine the basis for the genetic susceptibility of the Smyth line for this disease. The acceptance of the Smyth line model by the biomedical research community is further demonstrated by an invitation for Dr. Erf to present her research at a meeting of the National Vitiligo Foundation, to co-author a review on avian models for autoimmune diseases in *Advances of Immunology*, and to author a book chapter on avian autoimmune disease models for a book on *Poultry Immunology*.

In addition to advancing our understanding of vitiligo, immunopathogenesis and autoimmune disease, the Smyth line model also greatly aided in advancing Dr. Erf’s research in other areas of poultry immunology. She currently has four undergraduate students and two Ph.D. students working on projects.



Photo illustration by Shawna Sexton

USING POULTRY TO HELP HUMANS - The mutant Smyth line and control lines of chicken is the only animal model for the human pigmentation disorder vitiligo.



## Fighting pathogens in turkeys by going to the source

The pathogen *Campylobacter*, Dan Donoghue says, is “a very interesting organism.” His team found that it occurs naturally in turkeys’ male and female reproductive tracts. To make things more complicated, it appears that artificial insemination procedures at turkey farms could expand the pathogen’s prevalence.

But another procedure used on the farm “placing antibiotics in turkey semen” could offer some hope for fighting *Campylobacter* there. Donoghue’s Food Safety Consortium research project at the University of Arkansas is testing antibiotics to determine their effectiveness against foodborne pathogens.

*Campylobacter* bacteria are commonly found in poultry intestinal tracts. “*Campylobacter* doesn’t cause disease in birds, it causes disease in people,” said Donoghue, “It apparently doesn’t hurt the productivity of the birds.”

The U.S. Department of Agriculture says *Campylobacter* can exist in the intestinal tracts of some animals without causing any symptoms or illness. However, if people consume live bacteria in raw milk, contaminated water, or undercooked meat or poultry, they may acquire a *Campylobacter* infection (also called campylobacteriosis). The illness symptoms include diarrhea, stomach pain and nausea.

Thorough cooking of poultry will eliminate the pathogen, but food safety researchers want to reduce or eliminate it at the source as much as possible.

On the turkey farms, Donoghue explained, artificial in-

semination is the means by which nearly all turkeys are produced. A male turkey’s semen is used to inseminate multiple females. But the current concern is over the possibility that semen contaminated with *Campylobacter* could be spreading the pathogen to females and the next generations.

“Semen collection, by nature of the tom’s anatomy, is predisposed to fecal contamination,” Donoghue said. Additionally, semen on commercial turkey farms is pooled before it is used to inseminate hens, making it possible that contaminated semen could spread through entire flocks.

With these hurdles facing producers, Donoghue sees some possible solutions for research to pursue. One approach takes advantage of semen extenders, which are added to turkey semen to increase the volume and extend their usage.

“Some extenders have antibiotics, some don’t have antibiotics and some have different antibiotic combinations,” he said. “We’re hoping that some of these with antibiotic combinations will be more effective against *Campylobacter*.”

Semen has not been considered a potential source of pathogenic bacteria until recently, so its extenders have not been tested against foodborne pathogens to measure their effectiveness. “We’re hoping to find one that is

already being used that will be effective against foodborne pathogens,” Donoghue noted.

In addition to searching for the right antibiotic, Donoghue is also testing whether cooling the semen would reduce or eliminate *Campylobacter*. The catch is to cool the semen enough to hurt the pathogens without damaging the viability of the sperm.

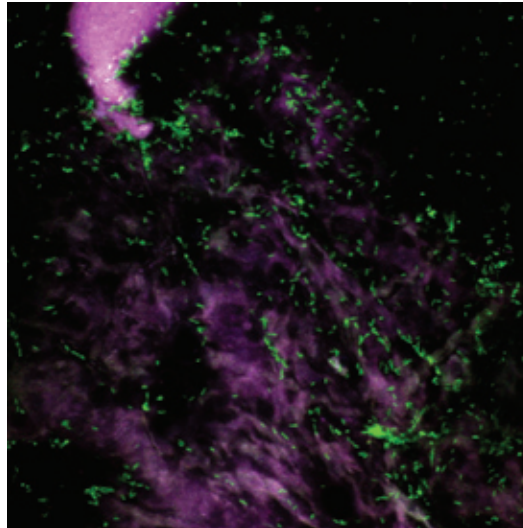


Photo courtesy of USDA ARS

**CAMPYLOBACTER** - This image shows microscopic campylobacter cells (shown in fluorescent green) on the outside of poultry skin.

## Gaining important clues on how disease organisms persist in the reproductive tract of laying hens

Dr. Young Min Kwon was awarded a \$541,368 grant from the National Institutes of Health (NIH) to develop effective measures to aid in the control of *Salmonella enteritidis*, which accounts for about half of all cases of foodborne illness, according to the Centers for Disease Control (CDC).

“Other researchers have already sequenced the genome, we are now building on this research by dissecting the genome of *S. enteritidis* and identifying the particular genes that are essential for infecting laying hens and mice,” said Kwon.

“For a large portion of these genes, we have limited information on their biological functions. With this research, we are hoping to gain important clues on how *S. enteritidis* persists in the reproductive tract of laying hens, causing healthy birds to lay contaminated eggs and cause disease in humans,” said Kwon.

Kwon said there are approximately 4,800 genes in the genome and the process of identifying and characterizing them will take time. He hopes other researchers use his findings in order to do a more in-depth study on particular genes. “We will be another step in the research cycle, and hopefully by expanding on each other’s findings we can eventually eradicate this disease,” said Kwon.

The CDC recommends that consumers refrain from eating uncooked eggs. If eggs are properly stored and thoroughly cooked, the *Salmonella* organisms will be destroyed and won’t make anyone sick. They also recommend washing hands and any utensils that were in contact with raw eggs in order to avoid cross-contamination.

*Salmonella enteritidis* is the main type of *Salmonella* that causes human foodborne illness, according to the CDC. Symptoms include fever, abdominal cramps and diarrhea, typically beginning

within 12 to 72 hours after consuming a contaminated food or beverage. The illness lasts four to seven days and is typically treated with antibiotics. In rare cases, those infected require hospitalization. Elderly patients, infants and those with impaired immune systems are at greater risk.



Photo by Karen Eskew

GOING OVER THE DETAILS - From left, Dr. Young Min Kwon, assistant professor in poultry science at the University of Arkansas, assembles his research group to go over the details of his upcoming grant project. Fellow researchers shown above are Mandy Cox, program specialist; Chris Hansen, M.S. student in the Cell and Molecular Biology (CEMB) program; and Nicole Mitchell-Calhoun, Ph.D. candidate in the CEMB program.



## Safe alternatives to antibiotics

Dr. Billy Hargis and other researchers at the Arkansas Agricultural Experiment Station, have isolated harmless bacteria that, when administered to chicken and turkey poults in their water, compete for food and attachment sites in poultry intestinal tracts with *Salmonella*, *Campylobacter* or other illness-causing bacteria that can contaminate meat during food processing.

The process, called competitive exclusion, is a safe alternative to antibiotics. It is also effective in protecting poultry from bacterial infections and accelerates the birds' natural immunity to harmful bacteria.

UA researchers under the leadership of Dr. William Huff, are also developing bacteriophages, viruses that attack only bacteria, for use in poultry health care and food safety. Bacteriophages occur naturally everywhere.

"We've isolated several bacteriophages that attack *Salmonella* and tested several combinations to develop a 'cocktail' of phages that are very effective in protecting poultry from respiratory infections," Stacy Higgins, doctoral student said.

IT'S IN THE WATER -  
(Right) Turkey poults drink water containing harmless bacteria that can compete with illness-causing bacteria and help add a layer of food safety protection.

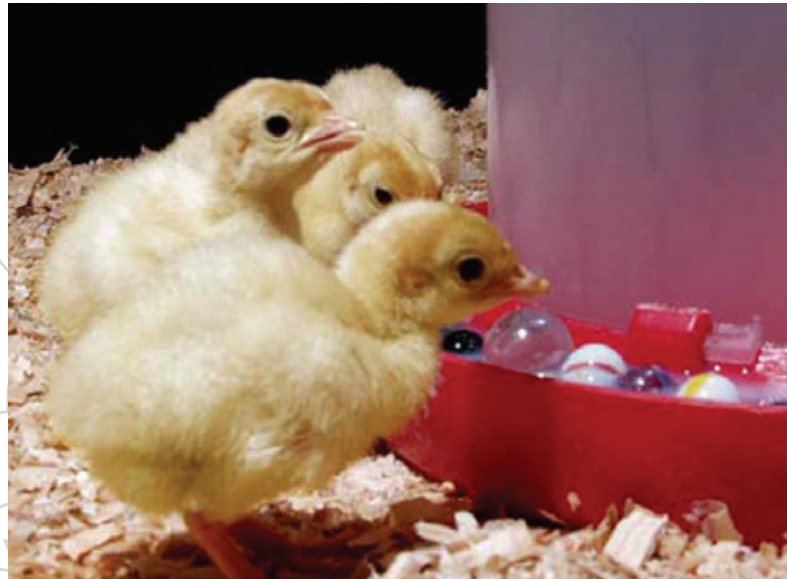


Photo by Fred Miller

## Rapid PCR assay for foodborne pathogens

Dr. Michael Slavik and UA researchers have developed a multiplex polymerase chain reaction (PCR) assay that is specific for the detection of *Campylobacter jejuni*, *Salmonella*, *Escherichia coli* 0157:H7, and *Listeria monocytogenes*. This was accomplished by combining PCR primers for detection of *C. jejuni* with published primers for the other three pathogens. Additionally, researchers have developed food sampling methods that are compatible with the PCR assay and are determining the efficacy and sensitivity of the multiplex PCR assay in a variety of food products.

This research has great potential for the detection of microorganisms, allowing rapid and specific detection of pathogenic, spoilage, and indicator organisms. This assay would be beneficial not only in reducing the time in which appropriate measures could be taken to remove contaminated food from consumers, but also in reducing the time of diagnosis and treatment.

It would also allow outbreaks to be properly followed; thus allowing researchers to better understand the health risks associated with these genera of bacteria.

Detection of these pathogens would have a great economic impact on the attempt to reduce or eliminate them from the food supply. As reduction is taking place, sensitive assays that detect low numbers of organisms need to be developed and implemented at intervention points to ensure that the number continues to be reduced and ultimately eliminated.

## Biomarker development for feed efficiency in broilers

For their recently funded National Science Foundation technology transfer grant, Drs. Neil Pumford and Walter Bottje will determine a correlation between differences in phenotypic protein expression and feed efficiency so that birds with high feed efficiency (FE) can be selectively identified for inclusion into a breeding line.

This Phase I project focuses on the development of a low cost assay using a biosensor (developed by Dr. Yanbin Li - see p. 5) for protein detection with the sensitivity necessary to rapidly differentiate protein expression levels in low and high FE broilers.

This technology will be advantageous to the poultry industry in several ways: the overall expense required to feed broilers will decrease while overall meat production will increase and an increase in the manufacturing competitiveness of an important U.S. industry will be realized.



Photo by Frank Jones

**FEEDING EFFICIENTLY-** Chicks are shown in their feed box in a poultry house. Drs. Pumford and Bottje are finding ways to identify broilers with high feed efficiency so they may be included into breeding lines and hopefully decrease feed expenses incurred in the future by the poultry industry.

## Understanding the genetic components of ascites susceptibility

The completion of the poultry genome project has created the opportunity to further understand the interrelationships of genotype and phenotype. Faculty members Nick Anthony and John Kirby have taken this effort to the next level through a comprehensive study designed to identify Quantitative Trait Loci (QTL) and Single Nucleotide Polymorphisms (SNP) variations for birds that are susceptible and resistant to ascites induced through hypobaric hypoxia.

In collaboration with Dr. Janice Balog USDA-ARS (retired), hypobaric hypoxia was used to develop ascites susceptible divergent lines. The research lines are currently in their 12th generation of selection and exhibit ascites mortality of 20% (resistant) and 95% (susceptible). Through specific line crossing, pedigreed F1 and F2 progeny were used to generate a comprehensive genetic and phenotypic data base.

Molecular analysis has revealed substantial QTL and SNP variation for F2 birds susceptible and resistant to ascites. Application of bioinformatics will aid in the identification of meaningful markers or marker combinations that account for ascites related variation.

Results from this work will be used to screen populations to reduce the frequency of detrimental genes with attention focused on maintaining economically important traits that may be correlated with ascites susceptibility. Progress in this research will translate to a general improvement in animal health as well as production profitability.



## The interaction of sodium chloride levels in poultry drinking water and the diet of broiler chickens

Drinking water in some areas of poultry production contains relatively high levels of sodium and chloride. Producers in these areas often complain of problems that might be associated with excess consumption of these two minerals, which includes wet litter and associated footpad disorders, poor weight gain and feed conversion, and loose droppings.

To address these issues, Drs. Park Waldroup and Susan Watkins conducted research and evaluated the effects of sodium and chloride levels in drinking water on the performance of broilers and the interaction with sodium and chloride levels in the diet.

It was found that levels of sodium and chloride in drinking water and in the diet significantly affected live performance of broilers, with



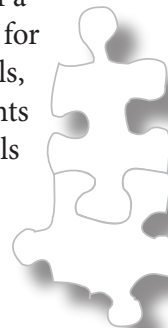
Photo by Shawna Sexton

**TAKING A DRINK** - Chicks are shown getting a drink from a waterer in a poultry house.

chloride should be made based on levels of these minerals in the drinking water.

a significant interaction between dietary and water levels.

Water sources of sodium and chloride can be used to provide part, or all, of a chick's needs for these minerals, and adjustments in dietary levels of sodium and



## Exclusive worldwide licensing agreement for molting technology

Drs. Robert Wideman, Jr., and Wayne Kuenzel, both poultry physiologists, worked cooperatively with Danny M. Hooze, president of Hooze Consulting Service, Inc., to conduct four successful studies using caged laying hens.

These studies were conducted at the UA's poultry farm and were funded with a \$20,000 grant from the United Egg Producers. Following these tests, a successful molting trial was conducted with Cobb broiler/breeder hens.

As a result of this initial research, Hooze Consulting Service, Inc., announced this year that an exclusive worldwide license agreement had been signed with the U of A to develop and market the thyroxine molting technology. Currently, a U.S. patent is pending.

Four more studies were planned between June and December 2005 with caged laying hens, broiler breeder hens and turkey breeder hens. If successful, funding up to \$325,000 may be awarded in 2006 for expanded research.

**LICENSE TO MOLT** - From left, Drs. Wayne Kuenzel and Robert Wideman, Jr., conducted successful molting research that led to an exclusive worldwide licensing agreement.



Photo by Karen Eskew

## Decreased production related to bone diseases in poultry

Dyschondroplasia is a bone disease in poultry that can cause decreased production and ultimately cost the poultry industry money.

Dr. Narayan Rath, USDA research scientist at the University of Arkansas, has focused his research efforts on this disease in order to identify its causes.

Research has determined that aberrant chondrocyte death (Apoptosis) in the growth plate is responsible for tibial dyschondroplasia.

Dr. Rath's research is now focused on understanding the physiological basis of bone strength and hopefully develop methods to improve bone strength and ultimately increase poultry production.

## Poultry manure management strategies to reduce non-point source phosphorus pollution



In order to determine the long-term impacts of manure management strategies on soil, water and air resources and to develop and evaluate best management practices to reduce non-point P pollution, Drs. Philip Moore, Jr., and Brian Haggard and others in the USDA-ARS Poultry Production & Product Safety Research Unit, are evaluating the sources and occurrence of nutrients, organic wastewater compounds, and antibiotic residuals at the watershed-scale.

To accomplish this, both long-term and short-term studies are being conducted. A long-term study (13 years) will be con-

ducted on the impacts of various pasture management strategies (over grazing, rotational grazing, haying, etc.) on pasture hydrology and nutrient runoff. The results of this study will be used to revise the Arkansas Phosphorus (P) Index.

Another long-term study (20 years) is being conducted on the effect of alum-treated poultry litter, normal poultry litter and ammonium nitrate on soil chemical characteristics, forage yields, P runoff and P leaching.

Experiments will also be conducted on the effect of pasture renovation and litter incorporation on nutrient runoff and ammonia (NH<sub>3</sub>) emissions. Ammonia emission factors will also be measured from commercial broiler houses and on land following manure application. Research in streams and rivers will be conducted to determine how nutrient enrichment in the sediments effects P uptake and release from the water. Research will also be conducted on the amounts and sources of nutrients, organic wastewater compounds and antibiotic residuals in streams.

The ultimate goal of this research is to develop cost-effective best management practices (BMPs) for poultry manure management which improve air and water quality.

**WATER QUALITY-**  
Researchers in the USDA Agricultural Research Service at the University of Arkansas continue to study poultry manure management and look for ways to improve air and water quality.



Photo courtesy of USDA ARS



## Studying the gastrointestinal tract in birds to help combat disease

The gastrointestinal (GI) tract performs important metabolic, immunological, and barrier functions in the bird. It is often the first line of defense against potential disease causing agents. Changes in the rate of developmental competency of the GI tract can either enhance or impair disease resistance of the bird.

Dr. Annie Donoghue, USDA ARS Research Leader, along with ARS and university colleagues within the Center of Excellence for Poultry Science, is researching the gastrointestinal developmental competence and dysfunction by characterizing the effects of intestinal maturation, function and disease resistance. Dr. Donoghue is employing proteomics, biochemical, immunochemical and functional genomic technologies in the study of gastrointestinal metabolic disorders.

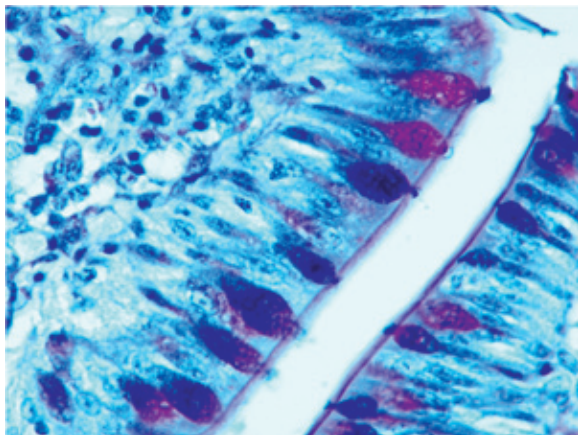


Photo courtesy of USDA ARS

**GUT REACTION** - The above shot is of acidic mucin goblet cells in the duodenum of poults.

## Stress and disease in turkeys

Stress can lead to an increased susceptibility to infection and disease. What can be confusing is that lower levels of stress can also increase protection from disease. The effects of stress are so variable because they are specific for the type, degree, and duration of stress. They are also influenced by the complexity of the immune system

and the neuroendocrine system, and by individual genetic differences affecting physiology and psychology. The development of each individual bird's response to stress is then also strongly influenced by the environment, which includes all previous experience, as well as nutrition and disease.

To continue to unlock the mysteries involving stress and disease in turkeys, Dr. Gerry Huff of the USDA ARS poultry research group uses an experimental model to produce *E. coli* air sacculitis and osteomyelitis by "stressing" birds with injections of one of the major chemicals involved in the birds' response to stress, or by using cold stress or transport stress to suppress the immune system.

This model clearly and reproducibly shows that too much stress can lead to an increase in disease and bacterial contamination, particularly in fast-growing male turkeys.

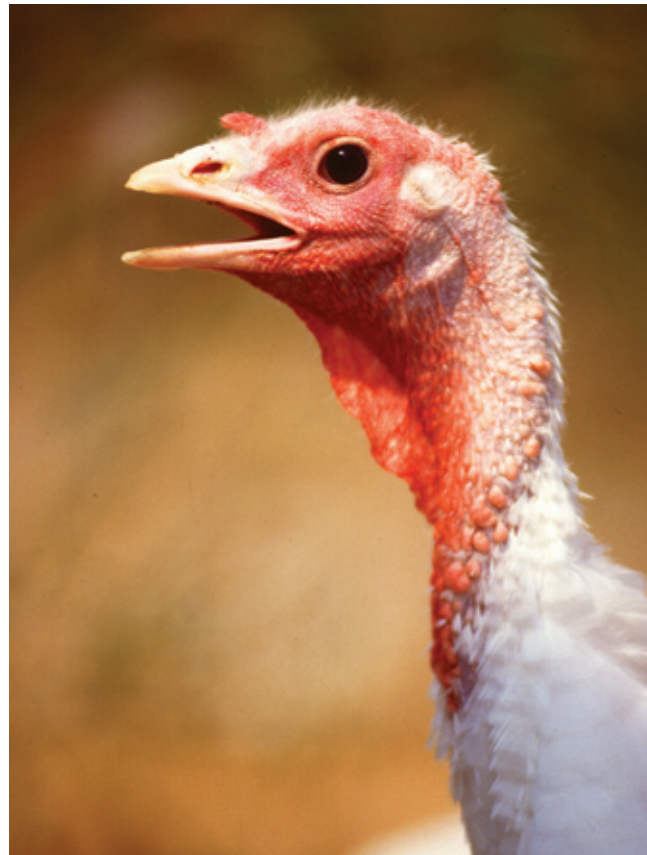


Photo courtesy of USDA ARS

**TOO STRESSED?** - USDA researchers have found that too much stress on animals can lead to increased susceptibility to infection and disease.

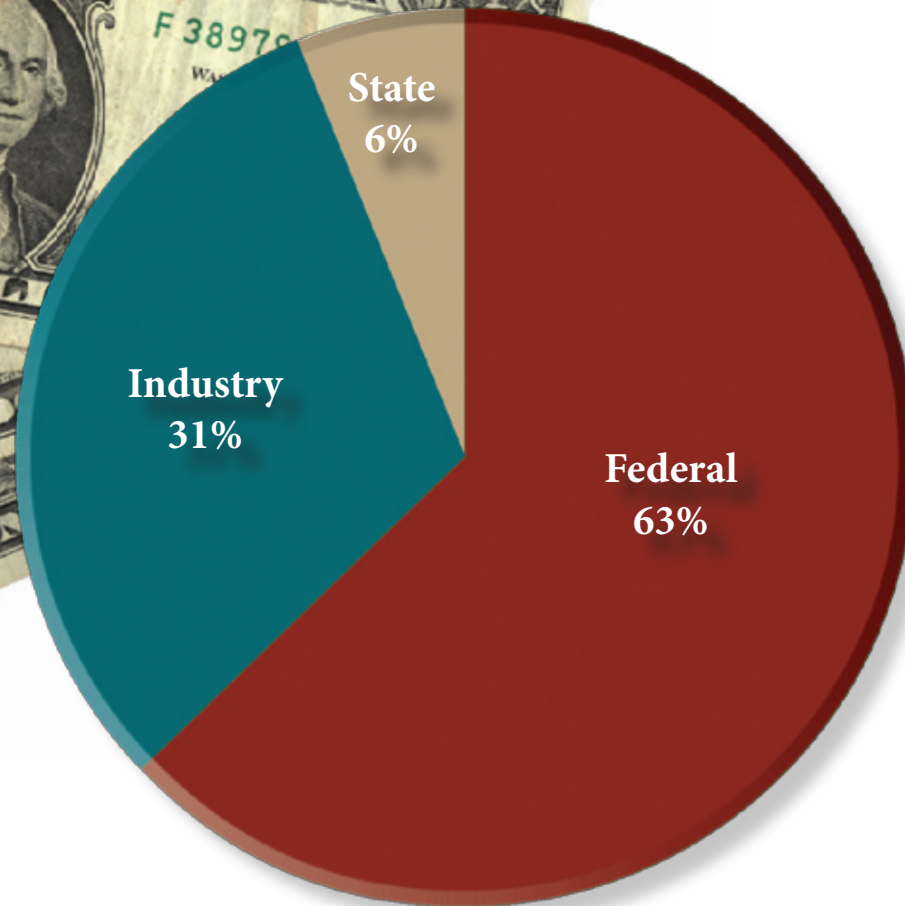
# *sponsored* **SUPPORT**

## Breakdown of Support Dollars:

Federal ..... \$ 1,473,374.00  
Industry ..... \$ 711,303.00  
State ..... \$ 160,000.00

Total dollars for research and sponsored support for fiscal year 2004-2005:

# \$2,344,677.00



The amounts listed above do not include dollars from faculty members whose grant money was credited in another department on campus. Research on poultry and related areas by faculty members who have shared appointments or were co-investigators on projects with faculty members in other departments totaled:

# \$644,821





*teaching* **HIGHLIGHTS**



**In poultry science, we're HOG WILD about our students!**

*Want to find out more? log on to our website: [poultryscience.uark.edu](http://poultryscience.uark.edu)*

## Kirby wins Outstanding Faculty Award

Dr. John Kirby, UA poultry science professor, received the Outstanding Faculty Award from the Student Alumni Board and the Associated Student Government at the 6th Annual Faculty Appreciation Banquet.

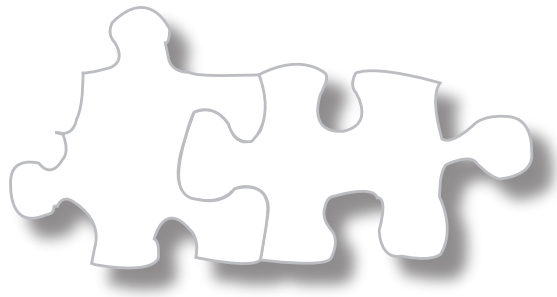


Photo by Fred Miller

Nicole Mitchell, one of Dr. Kirby's doctoral students in the Cell and Molecular Biology Program, of which Dr. Kirby is the director, nominated him for the award.

"I have been so impressed with Dr. Kirby's dedication to his students and the program in general, that I just had to nominate him for this award. He is truly an invaluable part of this university and deserves to be recognized for his efforts," said Mitchell.

Dr. John Kirby



## Dr. Jason Emmert awarded The Poultry Federation Endowed Chair

Dr. Walter Bottje, department head of poultry science, announced Oct. 13, 2004, the appointment of Dr. Jason Emmert to the Poultry Federation Endowed Chair for Poultry Science in the Dale Bumpers College of Agricultural, Food and Life Sciences and the U of A System's Division of Agriculture.

Emmert, an associate professor, joined the poultry science faculty in 1997 as the Undergraduate Curriculum Coordinator. In 2002, Emmert received the Purina Mills Award for Excellence in Teaching. In 2003, Emmert was inducted into the University of Arkansas Teaching Academy.

"Dr. Emmert is recognized as one of the leading educators in the poultry field and I'm proud that our college, in cooperation with the Poultry Federation, can honor his outstanding work in this manner," said Dr. Gregory Weidemann, dean of the college and associate vice president of the Division of Agriculture.

"It's obvious to me this poultry center continues to balance the importance of both teaching and research in their programs,"

said Morrill Harriman, president of the Poultry Federation. "I was completely in agreement with the selection of Dr. Emmert for this position."

The chair was endowed by the Poultry Federation in 1998 to be held by a faculty member for three to five years to promote a program area and then moved to a different program.

Funds generated from the endowment will be used toward the enhancement of Emmert's teaching programs in the Department of Poultry Science.



Photo by Fred Miller

Dr. Jason Emmert

"Jason has been instrumental in recruiting, advising and mentoring our poultry science students," said Bottje. "I am delighted to present this award to him on behalf of the Poultry Federation and look forward to seeing the new programs he will implement with this award."



## Dr. Gisela Erf named Jack G. Justus award recipient for her teaching skills

Dr. Gisela Erf, immunologist in the Department of Poultry Science, was awarded the Jack G. Justus Endowment for Teaching Excellence in 2005, from the Dale Bumpers College of Agricultural, Food and Life Sciences. The award was presented at the College's Honors Convocation held April 21, 2005.

The recipient receives a monetary award to conduct teaching programs at the U of A and gives a college-wide seminar related to teaching.

Dr. Erf received her undergraduate degree (B.S. in Animal Science, 1981) and Master of Science (Reproductive Endocrinology, 1983) from the University of Guelph, Guelph, Ontario, Canada and her Ph.D. degree in Immunology from Cornell University, Ithaca, New York (1988).

Upon graduation she became Assistant Professor in Biological Sciences at Smith College in Northampton Massachusetts. Dr. Erf joined the Center of Excellence for Poultry Science on July 1, 1994.



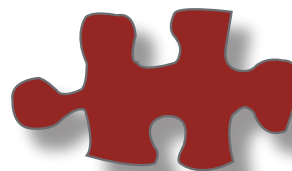
Photo by Jeff Erf

Dr. Gisela Erf

Dr. Erf teaches a graduate-level immunology lecture course, a graduate-level immunology laboratory course, and coordinates and teaches an undergraduate laboratory research course. She is a faculty member of the Intercollege Program in Cell and Molecular Biology and the College's Honors Faculty Committee.

Dr. Erf has an active research program in the area of avian immunology and poultry health.

Dr. Erf's research and teaching efforts have been recognized by several awards including the Young Investigator Award from the Pan-American Society for Pigment Cell Research (1992), the John W. White Outstanding Teaching Award (1999), the Poultry Science Association Teaching Award (1999), and the University of Arkansas Teaching Academy Award of Excellence (2001).



## Parker named Poultry Student of the Year

Drew Parker, senior poultry science major at the University of Arkansas, was named the Poultry Science "Student of the Year" by the U.S. Poultry & Egg organization at the International Poultry Exposition in Atlanta on Jan. 26, 2005.

Parker, the son of Suzette and Gary Elmore of Lonoke, is a 2001 graduate of Lonoke High School and served as the president of the Poultry Science Club.

"The U of A Poultry Science Club nominated me for this award and I am truly honored by their recognition," Parker said. "In order to be considered, I had to submit a resume, a transcript, two letters of recommendation, a list of previous honors and write an essay on my future aspirations in the poultry industry."



**STUDENT OF THE YEAR-**  
Drew Parker, UA poultry science major, was named the Poultry Science "Student of the Year" by the U.S. Poultry & Egg organization in January 2005.

Photo by Karen Eskew

## Graduate students win awards for research

Two graduate students from the Department of Poultry Science at the University of Arkansas competed and won at the Southern Poultry Science Society Annual Meeting held in Atlanta Jan. 24-25, 2005.

Carol Ojano-Dirain, a Ph.D. student from Pamplona in Cagayan, Philippines, received the Alltech Student Manuscript Award for her paper on mitochondrial function in broilers with low and high feed efficiency. Only one Alltech award is given out each year. Her paper was co-authored by her major professor, Dr. Walter Bottje; research assistant professors Dr. Muhammad Iqbal and Dr. Neil Pumford; undergraduate student Sydney Swonger; David Cawthon, National Toxicology Center; and Mark Cooper and Terry Wing, Cobb-Vantress, Inc.

Master's student Krishna Hamal from Nepal, won an Outstanding Research Presentation Award for his paper on maternal antibody transfer to offspring in broilers. Co-authors were his major professor Dr. Gisela Erf, and Igal Pevzner of Cobb-Vantress, Inc.

"I am extremely proud of these graduate students and the awards they have received. Our students continue to excel in their respective areas of research, and I

am pleased with their continued success at the national level," said Dr. Walter Bottje, department head for poultry science.



Photo by Karen Eskew

**WINNERS** - From left, poultry science graduate students Carol Ojano-Dirain and Krishna Hamal show off the awards they won at the Southern Poultry Science Society's Annual Meeting

## PSGA wins UA award for service project

The Poultry Science Graduation Association (PSGA) won the 2005 Outstanding Service Project of the Year Award from the Registered Student Organization at the University of Arkansas. The PSGA raised turkeys, processed them and then donated them to the Ozark Food Bank for distribution just prior to the 2004 Thanksgiving holiday. Congratulations to the PSGA!

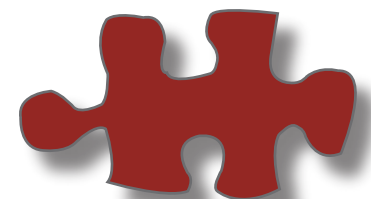
## Dr. Jason Emmert receives teaching award from USDA

Dr. Jason Emmert received a National Award for Excellence in College and University Teaching in the Food and Agricultural Sciences for the Southern Region.

This award was presented by the USDA on Nov. 14, at the 117th Annual National Association of State Universities and Land-Grant Colleges (NASULGC) meeting held in San Diego.

The award program is offered annually to honor a select group of college and university teachers who excel at teaching, make a positive impact on student learning and influence other teachers by example. It was originally designed to focus national attention on the teaching role in agricultural studies.

Teachers are nominated and then a selection committee chooses two award winners in each of the four USDA regions. Emmert received a plaque, a small statuette and a check for \$2,000, which will be used to enhance his teaching program.





## Meat & Poultry® Magazine ranks U of A third in nation for poultry and meat programs

Poultry science and animal science programs at the University of Arkansas were ranked No. 3 among the 10 best meat and poultry-related programs in the nation by Meat and Poultry® magazine's November 2004 issue, which was circulated throughout the United States and Canada.

The ranking was a move up from fourth place in 2003 and the second year in a row the university has moved up a notch. The Arkansas program includes research and extension branches in the Division of Agriculture and academic departments in the Dale Bumpers College of Agricultural, Food and Life Sciences. It has been in the top half of the top 10 in each of the four years the magazine has been ranking meat and poultry programs.

To determine rankings this year, the magazine gave emphasis to workshops, conferences and short courses the universities dedicated to the continuing education of executives and managers in the meat and poultry industries. Universities that topped the list, according to an article in the November issue, offered programs on "how to add value to meat and poultry products and develop new ideas that will help them manage more profitable businesses."

The magazine cited the U of A's focus on both processing and food safety issues

as reasons for its move up in the rankings. Both the poultry and meat programs at the U of A offer courses designed for quality assurance and production managers working in the industry.

U of A Vice President for Agriculture Milo Shult said the national ranking reflects major advances in statewide Division of Agriculture directed by animal science department head Keith Lusby and poultry science department head Walter Bottje, who is also director of the Center of Excellence for Poultry Science.

"Capable leadership and dedicated faculty develop imaginative and effective programs that have driven our animal agriculture programs to national prominence," Shult said.

Greg Weidemann, dean of Bumpers College and Division of Agriculture associate vice president for research, said, "Scoring near the top of this list four consecutive years, and moving up in the rankings the last two years, is a testimony to the hard

work of our faculty, staff and students and to the investment the Division of Agriculture has made in facilities throughout the state. A large measure of the credit also

goes to the support of the animal

industry, the state legislature and our congressional delegation."

Bottje said more than \$32 million has been invested by USDA, state government and the poultry industry in UA poultry facilities



over the past 10 years.

"We enjoy tremendous support that allows us to provide quality education and advanced, vital research that supports problem-solving outreach and extension to the poultry industry," Bottje said. "These, in turn, provide the support that helps keep our broiler, turkey and layer industries in positions of leadership in the global marketplace."

The Meat and Poultry® top 10 list, in order, includes Iowa State, Texas A&M, **University of Arkansas**, Kansas State, University of Georgia, The Ohio State University, Oklahoma State, Colorado State, Texas Tech and Auburn University.

## University of Arkansas poultry judging team takes first place at national contest

The University of Arkansas Department of Poultry Science judging team took first place at the 39th Annual National Collegiate Poultry Judging Contest Nov. 7-9, 2004, on the UA campus.

Eleven schools from across the country participated in the two-day event.

Neda Tilley, a sophomore from Leslie, had the highest individual score, and Valerie Brewer, a sophomore from Prairie Grove had the fifth highest score.

Other members of the UA team were Dustin Biery, a junior from Fayetteville; and Ashley Swaffar, a sophomore from Farmington. Alternate was Josh Evatt and coaches were Dr. Jason Emmert, associate professor and LeAnn Layman, a senior poultry science major from Springdale.

Following the first-place UA team, in order of scoring, were Kansas State University (KSU), second place; Penn State (PSU), third place; Louisiana State Univer-

sity (LSU), fourth place; and Texas A&M University (TAMU) fifth place. The other teams that participated were: Mississippi State University (MSU); North Carolina



Photo by Karen Eskew

**NATIONAL CHAMPS** - Front row from left, Valerie Brewer, Ashley Swaffar and Neda Tilley. Back row - Jason Emmert, coach, Josh Evatt, Dustin Biery and LeAnn Layman, members of the UA poultry judging team.

State University (NCSU); Stephen F. Austin University (SAFU); the University of Wisconsin-River Falls (UWRF); the University of Georgia (UGA); and West Virginia University (WVU).

Top 10 individuals for high score were: Neda Tilley (UA), John Small (NCSU), Kabel Robbins (KSU), Corey Bartholomew (PSU), Valerie Brewer (UA), Bo Kyle (LSU), Bradley Martin (TAMU), Jessica Butler (TAMU), Jacob Burden (KSU), and Matt Ventrella (PSU).

Sponsors for the event were The Poultry Federation, Arkansas Egg, Butterball, Cargill, Inc., Cobb-Vantress, Inc., George's Inc., and Tyson Foods, Inc. Special assistance to the contest was also provided by The Poultry Improvement Committee.



## Degrees Conferred 2004-05

### UNDERGRADUATES:

Oscar Antillon  
Ashley Cox  
Fauna Ganson  
Savannah Henderson  
Daniel Hinton  
William Andrew Parker  
Matthew Reynolds  
Tara Shasteen  
Destiny Sikes  
Amresh Tekawade  
Jerry Turner  
Jarrod VanBrunt  
Daniel Webber  
Ross Wolfenden  
Eric Wright

### GRADUATE STUDENTS:

#### Master's Program

Amber Lynn Golden  
Jeff Thuy Huynh  
Cody A. Keen  
Xiali Liu  
Leslie Nicole Loupe  
Christopher David Sartor

#### Doctoral Program

Mark Anthony Cooper  
Padmakumar Balakrishna Pillai



# scholarship RECIPIENTS

The fall 2004 and spring 2005 poultry science scholarship recipients. Thank you to our incredible supporters for your generosity.



<u>Name of Student</u>	<u>Name of Scholarship</u>	<u>Name of Student</u>	<u>Name of Scholarship</u>	<u>Name of Student</u>	<u>Name of Scholarship</u>
Adams, Luke	Randal Tyson Memorial	Layman, LeAnn	Hubbard	Waddell, Mindy	Darryl & Peggy Greene
Airola, Kaitlin	Poultry Science Matching	Leonard, Tamara	Randal Tyson Memorial	Whitlow, Joshua	Randal Tyson Memorial
Allen, Nathan	Randal Tyson Memorial	Martin, Cody	Poultry Science Matching	Williams, Austin	Grover Harris
Anthony, Aubra	Poultry Science Matching	Mason, James	Tom Edmiston	Williams, Matt	James Whitmore
Antillon, Oscar	Allied Industry	Morgan, Mark	Randal Tyson Memorial	Wright, Christopher	Randal Tyson Memorial
Atha, Jenna	Randal Tyson Memorial	Parker, Drew	Randal Tyson Memorial		Randal Tyson Memorial
Bailey, Lindsey	Randal Tyson Memorial	Pennington, Brittany	Poultry Science Matching		
Bateman, Kristin	E.L. Stephenson	Roberts, Cynthia	Poultry Science Matching		
	Randal Tyson Memorial	Rowland, Amanda	Randal Tyson Memorial		
Bean, Erica	Poultry Science Matching	Rowland, Emily	Richard Forsythe		
Biery, Dustin	Allied Industry	Shackelford, Spencer	Randal Tyson Memorial		
Brewer, Valerie	Randal Tyson Memorial	Shasteen, Tara	Randal Tyson Memorial		
Brown, Tonya	Poultry Science Matching	Smothers, Melanie	Randal Tyson Memorial		
Cobb, Maggie	Poultry Science Matching	Stark, John	Poultry Science Matching		
Cox, Ashley	Allied Industry	Swaffar, Ashley	Poultry Science Matching		
	Randal Tyson Memorial	Swonger, Sidney	Randal Tyson Memorial		
Davis, Brookee	Poultry Science Matching	Thompson, Jada	Poultry Science Matching		
Dixon, Drew	Poultry Science Matching	Tilley, Neda	Randal Tyson Memorial		
Finley, Regina	Randal Tyson Memorial	Uzdrowski, Amber	Allied Industry		
Hancock, Amanda	Randal Tyson Memorial	Uzdrowski, Audra	Randal Tyson Memorial		
Harger, Rachel	Randal Tyson Memorial	Van Brunt, Jarrod	Randal Tyson Memorial		
Henderson, Savannah	Allied Industry	Villines, Sarah	Poultry Science Matching		
	Randal Tyson Memorial		Allied Industry		
Hill, Beth	Randal Tyson Memorial		Randal Tyson Memorial		
Hollowell, Zach	Randal Tyson Memorial		Henry B. Shreve		
Horton, Drew	Randal Tyson Memorial		Poultry Science Matching		
Huff, Jeremy	Randal Tyson Memorial		Henry B. Shreve		
Lasater, Austin	Allied Industry		Poultry Science Matching		
	Randal Tyson Memorial		Randal Tyson Memorial		
			Allied Industry		

## Poultry Science Scholarships

This academic year, the Department of Poultry Science awarded our students

### \$106,654.00

Because of the tremendous support of our industry partners and donors, we have one of the BEST scholarship programs on the entire campus. Thank you to those who support our program through scholarships, the scholarship golf tournament, the Allied Auction, the Chicken Kitchen and more. Since 1995, our department has awarded over \$1.3 million dollars to deserving students. Without your support, many of these students could not attend school.



## Listeria Summit held on campus; hosted by Wal-Mart, Tyson and UA

Listeriosis, a serious infection caused by eating food contaminated by the bacterium *Listeria monocytogenes*, has recently been recognized as an important public health problem in the United States. The disease affects primarily pregnant women, newborns and adults with weakened immune systems.

Symptoms include fever, muscle aches, and sometimes gastrointestinal symptoms such as nausea or diarrhea. If infection spreads to the nervous system, symptoms such as headache, stiff neck, confusion, loss of balance or convulsions can occur.

In November 2004, Wal-Mart, Tyson Foods, Inc., and the University of Arkansas hosted a Listeria Summit for members in the food industry, which included educators, wholesalers and retailers.

Dr. John Marcy, food safety expert with the UA Cooperative Extension Service in the Division of Agriculture, served as organizer and host of the event.

Topics during the two-day summit included discussion about the illness, ways to avoid contamination in food processing and overall food safety with regards to the participants' business operations.



Photo by Karen Eskew

**LISTERIA SUMMIT** - From left, Dr. John Marcy, UA food safety expert; Gale Prince, Corporate Regulatory Affairs Director, The Kroger Company; and Dr. James Denton, National Alliance for Food Safety & Security Chairman and emeritus faculty member, attend a reception at Carnall Hall hosted by Tyson Foods, Inc., during the Listeria Summit on the UA campus.

**WAL★MART**



**UofA** UNIVERSITY OF ARKANSAS  
DIVISION OF AGRICULTURE



## Poultry Extension Faculty Member organizes “Meat Your Future”



Photo by Karen Eskew

MEAT YOUR FUTURE - From left, Dr. Susan Watkins, organizer of the event and poultry extension faculty member; Carrie Burnett, Ulanda Terry and Jade Briggs, all Tyson Foods, Inc., college recruiters; and Ashley Swaffar, sophomore poultry science major.

Tyson Foods “Meat Your Future” gathering was a major recruitment event on the UA campus. It gave students from across the campus the opportunity to explore employment opportunities, turn in resumes and meet team members from the largest protein provider in the world. After brief presentations by Tyson employees, students were able to enjoy one-on-one time with those responsible for hiring in the areas of QA/QC, nutrition, feed milling, processing, and more.

## Expanding poultry judging into high school curriculum

Dr. Jason Emmert and Jerry Wooley, Extension specialist, and Gary Davis, undergraduate recruiter, hosted an Agriculture Science Teacher Training Program at the University of Arkansas on June 15-16, 2005.

Participants in the program learned ways to incorporate poultry judging and poultry products into their agriculture curriculum. Teachers who attended received 16 hours of credit.

The two-day training program was comprised of three major components: preparing an FFA poultry judging team for competition; participating in the state fair market broiler competition; and, teaching poultry science in high school.

Thirty-four teachers participated in this inaugural class. The UA Extension group hopes to host the event annually.



Photo by Karen Eskew

TEACHING THE TEACHERS - Jerry Wooley, Extension poultry specialist shown center holding bird, instructs high school agriculture teachers from the state on poultry judging curriculum and procedures.

## Jerry Wooley wins “Specialist of the Year” award from state organization

Jerry Wooley, a University of Arkansas Division of Agriculture Extension specialist, received the “Specialist of the Year” Award at the Galaxy Conference in January 2005.

This award is given by the Arkansas Association of Cooperative Extension Specialists for recognition of outstanding performance in a single, difficult assignment and is not presented every year, but instead when it is merited by a member.

Mr. Wooley joined the University of Arkansas Cooperative Extension Service in April 1977 as a county 4-H Agent for Conway County, Arkansas. In 1983 he was promoted to County Extension Agent Agriculture Community Development Leader for Crawford County, where he served until assuming his present position in January 1991. Mr. Wooley has major responsibility in the Arkansas Youth Poultry Program.

Mr. Wooley develops relationships with the young people as well as their parents, 4-H leaders, and teachers and helps them to become aware of the opportunities in poultry science at the U of A and the poultry industry.

Mr. Wooley serves as the Superintendent of Poultry at the Arkansas State Fair and as a board member of the Arkansas Farm & Ranch. Mr. Wooley is chairman of the 4-H Broiler and BBQ activity at the annual Arkansas Poultry Festival.



Photo by Karen Eskew

**AWARD WINNER** - Jerry Wooley, left, Extension poultry specialist shown with a participant at a state barbecue contest, won the “Specialist of the Year” Award.

## Poultry Extension economist H.L. Goodwin, Jr., named co-chair

Extension Poultry Economist H.L. Goodwin, Jr., was named the academic co-chair of the Food Safety and Animal Health Working Group for Farm Foundations’ Future of Animal Agriculture in North America project.

In this position, Goodwin will have the primary responsibility for organizing and writing the Working Group report and coordinating that report with the other working groups in the project. With this appointment, Goodwin will be helping create policies that may affect the food on America’s dining room tables for years to come.



Photo by University Relations

Dr. H.L. Goodwin, Jr.

## Susan Watkins serves as chair of the National Egg Quality School

Dr. Susan Watkins, Extension faculty member at the University of Arkansas, served as Director of the National Egg Quality School (NEQS), which held classes at the Marriott East in Indianapolis, Indiana.

This was the 12th annual NEQS to take place and its mission is to teach participants “as much as possible about egg quality in a concentrated, comprehensive four-day course.”



Photo by Fred Miller

Dr. Susan Watkins



# Avian Flu: tangible threat or just for the birds?

When it comes to public health issues, there is a razor-thin line between appropriate caution and overcompensatory alarm. Such is the case with avian influenza, more commonly known as bird flu.

University of Arkansas professor Dustan Clark, a veterinarian, participates in an avian influenza advisory group that meets regularly to assess developments and potential threats, and offers these reminders to those concerned about potential flu pandemics.

“The best thing to remember is that there are public health physicians, veterinarians, and other individuals out there that are keeping up with what is going on with the disease in other involved countries,” explained Clark. “If there was to be a serious problem, the mechanism is in place to do something to handle it very quickly.”

Recent media articles, such as that in *The New York Times* magazine, have sounded alarms and prompted concerns about the possibility of avian influenza becoming the next pandemic to affect the U.S. and other developed and undeveloped nations, Clark said.

Clark says that in any given year, the wild waterfowl and shorebird populations have various avian influenza viruses. The viruses usually are not a problem in these

wild birds, but they can be a problem in domestic poultry.

Worldwide, there are many strains of the avian influenza virus that cause varying degrees of illness in poultry. Most of those viruses are classified as “low pathogen” and cause few, if any, signs of illness in fowl. The problem develops when those viruses mutate into highly pathogenic viruses and cause severe losses in poultry. Typically, avian influenza viruses that affect poultry and other birds do not affect people.

However, in 1997 an avian influenza virus (H5N1) did infect both poultry and a few people in Hong Kong. This was the first known instance of the avian influenza virus being transmitted directly from birds to people and causing severe illness and death. Since 1997 there have been a few other instances of the avian influenza virus causing illness or death in people.

The majority of the human cases have happened with people that were closely



Photo by Karen Eskew

THE ONCE OVER - Dr. Dustan Clark, UA extension poultry veterinarian, demonstrates how he examines a bird for disease.

associated with affected poultry. Influenza viruses constantly mutate, and epidemiologists are concerned that the avian influenza virus could infect a person who has a human influenza strain, creating a new mutant flu strain to develop that could spread easily from person to person.

The U.S. grappled during the fall with a shortage of vaccines for human influenza. When it comes to poultry, however, vaccination is the remedy of last resort. Re-

AVIAN FLU - continued on page 28

garding avian influenza, the best method of prevention is what is known as biosecurity, or monitoring and controlling disease in the poultry population before it becomes dangerous to humans.



Photo by Karen Eskew

**BIOSECURITY-** Because of the constant threat of spreading disease, biosecurity measures are extremely important to the poultry industry.

Clark, a veterinarian, says that while a human flu vaccine might help prevent avian flu, the best preventative is caution. People who travel abroad and visit poultry and livestock herds should take cautionary measures such as avoiding close contact with the animals and destroying or sanitizing clothing worn on the visits.

“Most diseases don’t cross species,” said Clark. “In the human population, the best preventative for disease is good sanitation and biosecurity. It’s a matter of risk assessment. The greater percentage of the population that practices biosecurity, or that receives a human flu vaccine, the less chance we have of avian influenza infecting a person that has human influenza. Thus there is a reduction in the threat of a new influenza mutant developing from a combination of the avian and human types and subsequently developing into a pandemic.”

There have been three pandemics in the 20th century, the worst of which was the Spanish flu pandemic of 1918-19. In recent years, however, a handful of people have died from avian flu in developing countries such as Vietnam and Thailand. Clark reiterates, however, that the current risk to the human population is very small.

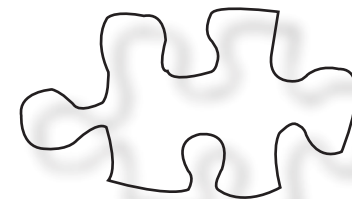
“Historically, we have not had documentation of the flu spreading from birds to people. That changed a few years ago with the 1997 outbreak in Hong Kong that later proved to be a form of AI that mutated

and spread to cause human disease,” he said.

Now, medical and veterinary experts believe for a true new pandemic to develop, it would take an entirely new human influenza subtype to emerge, one to which people have never been exposed and to which they would not have immunity. While this remains a frightening possibility, most experts believe avian influenza in humans is not a serious threat.

“Still, if there is any suspicion of avian flu in a poultry flock in this country, the flock would be quickly destroyed, and we believe that would almost always control the threat of spread to humans,” Clark said. “The problem is that this is not always what has happened in developing countries.”

For the general population, Clark advises logical preventative measures after potential exposure. “There is no need for alarm or panic in the general population,” said Clark. “Numerous health professionals are monitoring influenza; and, training, surveillance and education efforts continue. Plans for dealing with an influenza emergency have been developed and are continually updated so that the best control efforts available could be implemented should the need arise.”





## Director of broiler/breeder research farm busy with projects

For its very first full year in operation, the University of Arkansas Broiler Breeder Research Farm has been extremely useful.

Dr. Keith Bramwell, poultry Extension specialist and faculty director of the facility, has conducted three full trials and started two more.

These trials compared various pullet and hen feed management programs to understand better the nutritional needs of the modern broiler breeder hen. Each of these trials run the normal length of production for a breeder hen. Additionally, researchers have completed a trial to evaluate hen molting programs.

“Because our facilities are modeled after commercial-type housing, our operation is ideal for comparing production management programs and can then be easily adapted to industry situations,” said Bramwell.

The facilities include an office/quality assurance building; two breeder houses (40' x 400'); a pullet house (40' x 350') and complete shower-in facilities to maintain biosecurity.

“The pullet house has 16 pens for pullets and one pen for males. The pullet pens are currently hand-fed

according to the research protocol, but plans are underway to equip the house with a pan feeding system popular among commercial pullet growers,” Bramwell said.

The breeder house is subdivided into 48 pens to ensure replication of treatments, with spare pens available for several smaller pilot research trials.



Photo by Howell Medders

**RESEARCH BONANZA** - Because of the outstanding facilities at the UA Broiler Breeder Research Farm, the Director, Dr. Keith Bramwell, shown above looking over birds, has been very busy with industry research projects.

Research conducted at the facility this past year has been presented by Bramwell throughout the State of Arkansas, in addition to Alabama, Georgia, Texas, Canada and Brazil. Research conducted on the farm has also been presented in South America and Asia by representatives of Cobb-Vantress, Inc.

Examples of the types of research that can be conducted at the facility include nutrition, feed additives, feed management, behavior, lighting and breed comparison.

“Because the facilities are state-of-the-art and include all the necessary technology, it’s ideal for poultry production companies to use when doing research,” Bramwell said.

The on-site manager of the day-to-day operations of the farm is Judy England.

Cobb-Vantress, Inc., a subsidiary of Tyson Foods, Inc., originally donated \$1 million in 2004 to construct the facilities and the facilities continue to be improved upon to better reflect current industry standards.

## Extension hosts its international short course on production

Participants from around the world continue to attend the University of Arkansas Division of Agriculture's International Short Course on Modern Poultry Production at the Center of Excellence for Poultry Science each March and September. The week-long program of concentrated study, hands-on exercises and tours of poultry companies in the area was held on the University of Arkansas campus.

"The Division of Agriculture began the short course in 2000 to help provide a wider audience with a 'big picture' overview of the commercial poultry industry," said Dr. Frank Jones, Associate Director for the Center, Extension. "This course provides participants with the 'mental framework' necessary to understand both where information fits within the industry and how the various parts of the industry are connected."

Most participants in the short course are allied industry technical representatives, poultry industry representatives, who want to gain a broader knowledge of poultry production methods, and international poultry producers.

"The short course is truly a team effort," said Jones. "We employ several techniques to teach participants about the industry including lecture, demonstration, hands-on exercises and field trips to commercial poultry facilities in operation. The lectures, demonstrations and exercises are conducted by UA poultry faculty, which in my opinion are some of the most qualified in the world, while the tours are made possible by industry cooperators."

For more information about the International Short Course in Modern Poultry Production, contact Dr. Frank Jones through e-mail, [ftjones@uark.edu](mailto:ftjones@uark.edu), or by phone (479) 575-5443.

## POULTRY 101™ course continues to be offered on UA campus

University of Arkansas faculty member Dr. Casey Owens, along with Dr. Shelly McKee of Auburn University and Dr. Christine Alvarado of Texas Tech University, conducted their Poultry 101 workshop on the University of Arkansas campus May 10-12, 2005.

Poultry 101 is a three-day, hands-on workshop that introduces participants to the production and processing factors that impact final product quality, safety and consistency.

Topics included in the class are the history of the poultry industry, market segments, growout and nutrition fundamentals, processing steps, quality issues, further processing, food safety, emerging issues and international issues. The workshop includes lectures and hands-on laboratories filled with practical and up-to-date information.

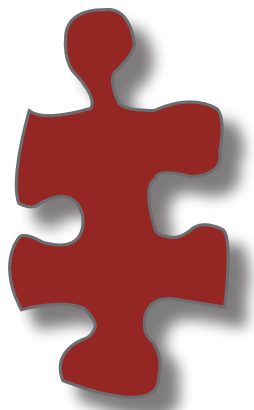
Participants are able to network with others in the industry from a variety of backgrounds. Past participants have included individuals in quality assurance, product development, engineering, sales and marketing, plant management and corporate restaurant management.

Companies that have sent employees to participate in previous classes include Tyson Foods, Inc., O.K. Foods, Pilgrim's Pride, Nebraska Turkey Growers Cooperative, Barber Foods, Outback Steakhouse, Land 'O Frost, Cobb-Vantress, Inc., Taco Cabana, Cracker Barrel, Wirebelt, BOC Gases and Stork Gamco.

Poultry 101 is proudly sponsored by Kerry Ingredients, Budenheim, FMC FoodTech and POULTRY Magazine.

For more information on how to register, visit [www.poultry101.com](http://www.poultry101.com).

This course is part of the Extension outreach of the Center of Excellence for Poultry Science.







## Department of Poultry Science undergoes CSREES review

The Department of Poultry Science underwent a comprehensive review in the spring of 2005 by four esteemed colleagues from other programs in the nation. During the three-day review period, which takes place approximately every seven years, the reviewers spent numerous hours on our campus going over all aspects of teaching, research and Extension activities of the Department of Poultry Science.

When the review was complete, the overall report from the reviewers was extremely encouraging. Reviewers were Dr. Gerald Havenstein of N.C. State, Dr. John Carey of Texas A&M, Dr. Roger Lien of Auburn and Dr. Jim Petite, also of N.C. State.

“It was apparent that the Center has positioned itself to truly be a leader of poultry programs in the U.S.,” said Dr. Walter Bottje, director and department head.

The review team expressed respect for the teaching, Extension and research programs and envy regarding facilities, interaction with the industry and quality of students.

“The expertise and experiences of these individuals...are like no other educational, research or commercial institution past or present,” said the review team in their report. They also indicated they were impressed with the staff’s dedication, camaraderie, and their obvious feelings of being an important part of the Center’s programs.

## Simmons Foods gift honors the company’s founding father

Siloam Springs-based Simmons Foods Inc. has provided a \$125,000 gift to support the University of Arkansas Dale Bumpers College of Agricultural, Food and Life Sciences.

The M.H. “Bill” Simmons Honors College Academy Scholarships will be created by \$120,000 and matched by \$120,000 from funds available through the Matching Gift Program to create a \$240,000 scholarship endowment. The remaining \$5,000 will go to the Department of Poultry Science. The Simmons Honors College Academy Scholarships will benefit highly-qualified students interested in poultry science and agricultural business.

Mark Simmons, chairman, is a second-generation owner of Simmons Foods Inc., which was founded in 1949 by Mark’s father, M.H. “Bill” Simmons. Under Mark Simmons’ direction, Simmons Foods has grown to become one of the nation’s largest privately held broiler processing companies. Mark’s son, Todd, is the president of the company. Simmons Foods produces and distributes fresh and frozen poultry products to grocery stores and restaurants. The company also makes ingredients for livestock feed and pet food, processes more than 3 million broilers a week and operates a feed mill, hatcheries and processing plants.



## Poultry Science Department raises over \$20,000 with golf tourney

A record 33 teams enjoyed a day of golf and raised just over \$20,000 for poultry science scholarships during the Sixth Annual University of Arkansas' Poultry Science Scholarship Golf Tournament April 26, 2005, at the Valley View Golf and Country Club in Farmington. Format for the tournament was a four-person scramble with a shotgun start.

Major sponsors for the tournament were Cobb-Vantress, Inc., FPEC and Safe Foods Corporation. Jones Motorcars of Fayetteville provided the car for the hole-in-one prize, Harps Food Stores provided snacks and the Arkansas Farm Bureau donated the items in the goodie bags passed out to participants.

The 2006 scholarship golf tournament will take place on Tuesday, April 25. Mark your calendars now!



Photo by Karen Eskew

**AFTERNOON WINNERS** - First place winners in the afternoon flight of the golf tournament were Simmons Food employees (from left) Bill Templar, Daryl Muldoon, Tom Roark and P.D. Rakestraw. Their team shot a 57.



Photo by Karen Eskew

**MR. JOHN TYSON**  
President & CEO, Tyson Foods, Inc.

## Tyson family donates \$7.6 million to the University of Arkansas

On Friday, May 13, 2005, Don Tyson and his family made a \$7.6 million gift to the University of Arkansas Campaign for the Twenty-First Century.

The gift will be used for academic support within the Dale Bumpers College of Agricultural, Food and Life Sciences (\$4 million), construction of a new Sigma Nu fraternity house (\$1.6 million) and toward the Arkansas Center for Oral and Visual History, which, upon approval from the University of Arkansas Board of Trustees, will be renamed the David and Barbara Pryor Center for Arkansas Oral and Visual History (\$2 million).

UA Chancellor John A. White said: "Members of the Tyson family have been outstanding philanthropists to the University of Arkansas through many years of association. Their generosity and leadership in supporting many initiatives - academic and athletic - have made

a great difference. We are indebted to Don Tyson and John Tyson for their leadership in the Campaign for the Twenty-First Century. Both serve on the Campaign Steering Committee. We are very grateful for this most recent example of the Tyson family's support of the U of A."

Later, on June 22, the Tyson Foods Foundation then gave a gift in the amount of \$12.5 million. This gift put the U of A over the one billion dollar campaign goal.

**LIKE FATHER, LIKE SON** - Don Tyson (Left) looks on as his son, John Tyson announces a \$7.6 million gift to the University of Arkansas. Generosity has always been a Tyson family trait.



Photo by Karen Eskew



## Dr. Memo Tellez receives Mexico's highest honor for career work

Dr. Guillermo (Memo) Tellez, a research professor in the Center of Excellence for Poultry Science, received the highest recognition in Mexico for his career research work from the Agencia Nacional de Evaluación de la Calidad y Acreditación or ANECA, which is the national poultry association in Mexico. The awards ceremony took place during ANECA's annual meeting in Puerto Vallarta in June 2005.

Tellez, a veterinarian, earned his Master of Science degree from the National Autonomous University (UNAM) in Mexico City. He went on to receive his Ph.D in Veterinary Pathobiology from Texas A&M University in 1992. After serving on the faculty in Avian Medicine at UNAM, he was promoted to Department Head for eight years prior to joining the University of Arkansas Department of Poultry Science in 2002.

Tellez has published numerous papers in the area of poultry health and has served as graduate advisor for more than 30 M.S. and Ph.D. students. Tellez is widely known in both the U.S. and Latin America for his work.

TOP HONORS -- Dr. Guillermo (Memo) Tellez, left, research professor at the Center of Excellence for Poultry Science, is shown accepting an award from the Agencia Nacional de Evaluación de la Calidad y Acreditación (ANECA), which is the National Poultry Science Association in Mexico.



Photo submitted

## Dr. Joe Beasley named 2005 Arkansas Veterinarian of the Year

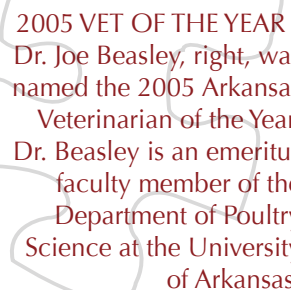
Dr. Joe Beasley, emeritus faculty member in the Department of Poultry Science, was named the 2005 Arkansas Veterinarian of the Year. Beasley retired from the U of A in 1995, but for the past decade has still shown up at the Center of Excellence for Poultry Science nearly every day.

"I just can't stop," said Beasley.

A native of Centerton, Beasley decided to become a veterinarian at age 10 when a young vet from Bentonville came to treat his family's ailing cows.

Beasley received his doctor of veterinary medicine degree and his master's degree in veterinary pathology from Texas A&M University in 1949, and went on to earn his doctorate in pathology from the University of Oklahoma.

Some of his research in poultry science centered around Marek's disease, a virus that causes tumors to develop in poultry. Beasley and other UA researchers were able to demonstrate the method by which the disease was spread.



2005 VET OF THE YEAR - Dr. Joe Beasley, right, was named the 2005 Arkansas Veterinarian of the Year. Dr. Beasley is an emeritus faculty member of the Department of Poultry Science at the University of Arkansas.

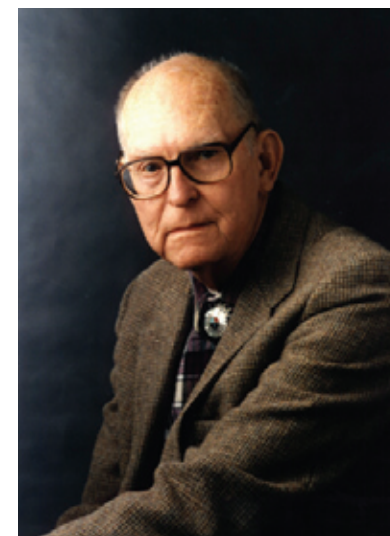


Photo by University Relations

## Dr. James Denton named to national committee for USDA

Dr. James Denton, emeritus faculty member in the Department of Poultry Science and past Director of the Center of Excellence for Poultry Science, was selected to serve on the Secretary's Advisory Committee on Meat and Poultry Inspection for the United States Department of Agriculture.

This appointment was effective May 2005 and will run until March 2007.

The purpose of the committee is to provide advice concerning state and federal programs with respect to meat and poultry inspection and other matters.

The committee also serves as a forum for meaningful dialogue on the U.S. meat and poultry regulatory system by providing input to help ensure the safest food supply for the American consumer.

The Secretary of Agriculture Mike Johanns will take advice and recommendations from representatives of the committee on current and new policies that affect state and federal meat programs.



Photo by Karen Eskew

**APPOINTEE** - Dr. James Denton was asked to serve on the Secretary's Advisory Committee on Meat and Poultry Inspection for the USDA.

## Dr. Robert Wideman, Jr., named to Board of Directors for C-FAR

The National Coalition for Food and Agricultural Research (C-FAR) announced the appointment of Dr. Robert Wideman, Jr., associate director of the University of Arkansas Division of Agriculture's Center of Excellence for Poultry Science, to serve on its board of directors.

C-FAR is a coalition of 20 national organizations, 43 universities and one corporation. Its mission is to sustain and enhance federal funding for food and agricultural research, extension and education. The Federation of Animal Science Societies (FASS) nominated Dr. Wideman for service on the C-FAR board. He previously served as president of FASS.

Dr. Wideman is a professor of poultry physiology in Dale Bumpers College of Agricultural, Food and Life Sciences. He joined the U of A in 1993 as the newly-established Arkansas Poultry Federation Chair.

In 2003, Wideman was appointed by U.S. Secretary of Agriculture Ann Veneman to serve on the Research, Education and Economics Task Force. The task force was formed to evaluate the merits of establishing national institutes for food and agriculture research.



Photo by Fred Miller

**Dr. Robert Wideman, Jr.**



# information & CONTACTS

## PUBLICATIONS

Book Chapters .....	6
Refereed Publications and Proceedings.....	51
Non-refereed Publications and Proceedings.....	100
Invited lectures .....	27

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