

differentiation

...setting ourselves apart

2005-2006
ANNUAL REPORT



The CENTER of EXCELLENCE for POULTRY SCIENCE
UNIVERSITY of ARKANSAS • DIVISION of AGRICULTURE





THE CENTER OF EXCELLENCE
FOR POULTRY SCIENCE • ANNUAL REPORT
UNIVERSITY OF ARKANSAS - DIVISION OF AGRICULTURE • 2005-2006

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The cover of this year's annual report, "*Differentiation - Setting Ourselves Apart*," is exactly what has been happening at the Center of Excellence for Poultry Science since its inception. When the original vision of the CEPS was conceived it was exactly for the purpose of fostering, promoting and growing a collegial atmosphere of research knowledge that would serve the industry, citizens of Arkansas and the world. Therefore it should come as no surprise that important discoveries are being made all the time on the U of A campus by the award-winning faculty, staff and students at the Center.

During the 2005-2006 academic year, we celebrated 10 years as a Center of Excellence and had the unique opportunity to look at our past and at our supporters and spend time evaluating where we have gone over this short time period. There was a celebration and time of reflection, but most of all there was a visioning of our future.

There were several highlights and awards received during this academic year, the details of those achievements are highlighted in the pages of this publication. Please take time and read about the recent research highlights of each of our faculty members.

I am looking forward to our future and to the continued collaboration with our industry partners. We continue to realize how important this relationship is, and are striving for our continued success together.

I also want to thank the industry for its generous scholarship support. Because of their gifts, we are the envy of the College. It will be a challenge in the coming years to keep pace with the outstanding growth in our student numbers and their needs, however we know the industry has always been a tremendous supporter of our program and we look forward to working with them to meet this challenge.

As we come to a close, let me say personally, I am exciting about the new ground we will be breaking in the future, I can't wait to see what happens next! Thank you for your support.

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

**research
highlights**

impacting the world



research results



DR. NICK ANTHONY
Breeding & Genetics

Results on broiler breeder lines selected for high-altitude susceptibility and resistance to ascites, a costly disease, has led to the establishment of metabolic genetic markers for this disease. Furthermore, these lines are being used by Drs. Erf and Wideman in the investigation of pulmonary inflammatory response to the lung.



DR. JASON EMMERT
Poultry Nutrition

A project was conducted to look at a new phytase product that appears capable of releasing phosphorus in phosphorus deficient diets. This product might help in reducing runoff of soil phosphorus, which is an important environmental problem. Studies on phase-feeding suggest that such feeding programs may be used in commercial poultry to maximize returns for the industry.



DR. DAVID CHAPMAN
Parasitologist

An international team of scientists from around the world was assembled to develop guidelines for evaluating the efficacy and safety of anticoccidial vaccines, and obtaining approval for their use in chickens and turkeys. Coccidiosis is a major disease of poultry that causes substantial losses in commercial production.



DR. GISELA ERF
Immunologist

Research has been conducted that provides important information on immune function in autoimmune diseases. Studies conducted with Dr. Bob Wideman provided important information on inflammatory mechanisms in the pulmonary vasculature.



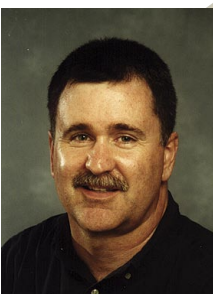
DR. CRAIG COON
Poultry Nutrition

Results from skip-a-day feeding programs in broiler breeders indicated that birds increase liver lipogenesis that could lead to fatty livers and be detrimental to broiler breeder production.



DR. BILLY HARGIS
Poultry Health, DVM

Research has been conducted in the area of health and wellbeing of poultry through improved understanding of disease resistance mechanisms and alternative means for treatment and protection, which includes using bacteriophage as an alternative to antibiotics.



DR. DAN DONOGHUE
Food Safety

Studies of *Campylobacter* reveal that it can be transmitted by sperm. These studies are important in understanding how artificial insemination can spread bacteria and how it could play a role in food safety.



DR. YOUNG MIN KWON
Microbiologist

Studies have been conducted on functional genomic analyses of bacterial pathogens (using *Salmonella* and *Campylobacter*) as model organisms to identify virulence genes. These studies are very important with regard to food safety.

research results



DR. WAYNE KUENZEL
Physiologist/
Neurobiologist

Studies on molting with Dr. Bob Wideman indicate that providing iodinated casein to the diet enables molting to occur without feed withdrawal, thus helping provide an important management tool to the layer industry and solving a major animal wellbeing concern.



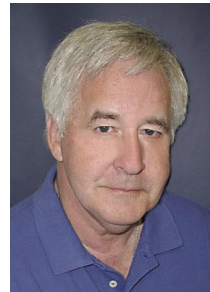
DR. MIKE SLAVIK
Microbiologist/
Food Safety

Studies were done on biofilm formation, cytotoxicity, and effects of stress on *Campylobacter jejuni*. It was found that *C. jejuni* are poor biofilm formers, but do become entrapped in biofilms produced by other bacteria. Development of rapid diagnostic tests for pathogenic and spoilage bacteria continue.



DR. YANBIN LI
Food Safety

Current research by Dr. Li includes using biosensors for rapid detection of pathogenic bacteria, microbial predictive models and risk assessment simulation, and antimicrobial technologies for food safety and security.



DR. PARK WALDROUP
Poultry Nutrition

Continued studies on low protein diets in broilers, conducted by Dr. Waldroup, are helping the poultry industry make decisions regarding nutrition management and feed cost control.



DR. CASEY OWENS
Poultry Products

Studies conducted on sensory evaluation of pasture raised birds and breeds with different growth rates provided important information to growers involved in organically grown broilers. It was found that the water holding capacity of meat was superior in faster-growing breeds of broilers and meat color was altered by outside access of slow-growing breeds.



DR. BOB WIDEMAN
Poultry Physiologist

Studies (in collaboration with Wayne Kuenzel) have helped develop a new way of molting birds without feed withdrawal. Feed withdrawal to induce molting has become an issue in poultry production, particularly in table egg-laying hens, therefore, a method that allows for molting in hens without feed withdrawal has become very important.



DR. STEVEN RICKE
Food Safety

During the fiscal year, Dr. Ricke was named the Donald "Buddy" Wray Endowed Chair in Food Safety and was chosen to serve as the Director of the Center for Food Safety and Microbiology. He conducts research on foodborne pathogen ecology fermentation and anaerobic microbiology.



New Faculty Member

DR. BYUNG WHI KONG
Molecular Virologist
Proteomics/Genomics

Joined the faculty in August 2006, just after the start of the new fiscal year.

USDA/ARS research results



DR. ANNIE DONOGHUE
Research Leader

Research is focused on developing alternatives to antibiotic use in poultry and developing strategies to reduce or eliminate pathogen contamination. Awarded the 2006 Federal Laboratory Consortium, Mid-Continent Region, Excellence in Technology Transfer Award in collaboration with U of A Center Faculty for development and technology transfer of novel probiotics that target human food safety pathogens and improve poultry health.



DR. NARAYAN RATH
Physiologist

Leg weakness that results in lameness and bone breakage is a serious economic problem for the poultry industry that is attributed to poor connective tissue growth and improper bone formation. Unit scientists have contributed significantly to the understanding of this problem and have developed methods to reduce bone weakness.



DR. GERRY HUFF
Microbiologist

New tools and methods to study the effects of stress in turkeys will improve turkey welfare, disease resistance, and the safety of turkey food products. Improvement of the turkey stress response will lead to a decrease in the usage of antibiotics for turkey production.

The Poultry Production and Product Safety Research Unit of the Agricultural Research Service USDA is located within the Center of Excellence for Poultry Science on the University of Arkansas Campus in Fayetteville, and their scientists collaborate seamlessly with the Center of Excellence for Poultry Science faculty. The annual budget for this unit is \$1.6 million. **This unit employs over 25 scientists, research specialists, students and other personnel.**

Unit Goals include:

- ✓ Finding ways of **reducing air, soil and water pollution** from poultry litter, while increasing its effectiveness as a fertilizer
- ✓ Developing **alternative approaches to antibiotics** for controlling diseases in poultry, and
- ✓ **Reducing stress and metabolic diseases** in poultry

The scientists in this unit are **internationally recognized** and during the 15 years since this program was established in Fayetteville they have:

- ✓ **Produced** over 400 scientific manuscripts and book chapters
- ✓ **Presented** over 50 international invited talks
- ✓ **Obtained** 13 patents (five pending)
- ✓ **Trained** approximately 40 graduate students and visiting scientists
- ✓ **Received** recognition internationally with multiple awards from scientific societies
- ✓ **Several inventions/discoveries** currently used in animal agriculture

Extramural support of research (a majority with University of Arkansas faculty collaboration) has generated over **\$4.4 million dollars in the past five years.**



DR. BILL HUFF
Physiologist

Leaders in establishing that bacteriophage (viruses that infect and kill bacteria) can provide an effective alternative to antibiotics. Recent studies demonstrated that bacteriophage administered early in a severe E. coli respiratory disease can dramatically decrease the mortality associated with this disease, and that multiple bacteriophage treatments provided complete protection to the birds.



DR. PHILIP MOORE, JR.
Soil Chemist

Led a team that contributed to the Arkansas Phosphorus Index from data obtained from hundreds of rainfall simulations conducted with various fertilizer and manure sources. This index is used to determine how much manure can safely be applied to pastures without causing a high risk of phosphorus runoff.

Bird brains shown more advanced than name implies

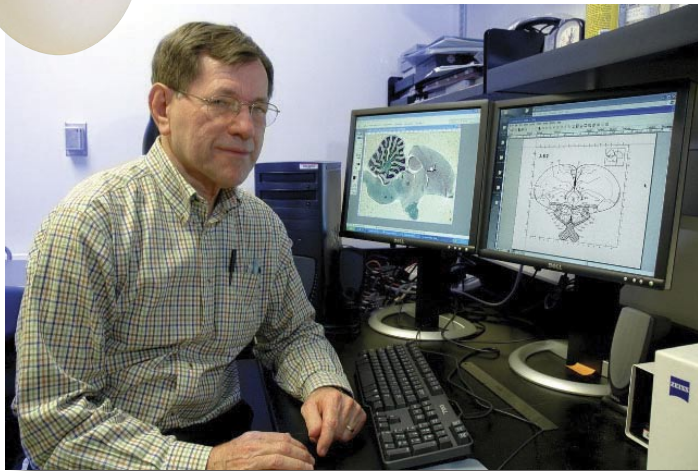


Photo by Fred Miller

BRAIN MAPPING - Dr. Wayne Kuenzel, neurobiologist in the Department of Poultry Science at the University of Arkansas, is shown with digitized images mapping structures of the chicken brain.

FAYETTEVILLE, Ark. — The term “bird brain” doesn’t mean what it used to.

The avian brain is more advanced than was once thought, said Dr. Wayne Kuenzel, poultry neurobiologist for the University of Arkansas Division of Agriculture. The traditional nomenclature for many of the brain structures, developed nearly a century ago and based on early misconceptions, no longer makes sense, he said.

Kuenzel was part of an international consortium of neuroscientists who have proposed renaming the structures of the avian forebrain, thereby correcting the scientific nomenclature and giving birds their due.

Appropriate naming is important to Kuenzel because he studies poultry brain structures to determine sites that are important for specific functions such as reproduction and courtship behavior. For example, he is locating nerve cells in chick brains that respond to light in terms of recognizing seasons.

“Many birds are photoperiodic,” Kuenzel said. “Their physiological systems respond to changes in the length of daylight.”

His research locates these cells in the brain and determines how they may work.

“These are the very first nerves in a cascade of neural pathways that activates the reproductive system,” Kuenzel said.

Down the road, such information could help determine which birds will have reproductive systems that are most responsive to changes in light. This would be a valued trait in commercial breeder flocks, he said.

His work in avian brain structures and functions led Kuenzel to participate in the Avian Brain Nomenclature Forum. The group began with a meeting in 2002 organized by Duke University neurobiologist Erich Jarvis and University of Tennessee Health Science Center neuroanatomist Tony Reiner. The National Science Foundation and the National Institutes of Health funded the forum’s efforts.

The group concluded, in a paper published in *Nature Reviews Neuroscience* in 2005, that birds are similar to mammals in

cognitive ability. The new nomenclature was developed to provide consistency in language between mammalian and avian neuroscientists. Kuenzel, one of 29 co-authors of the paper, said the terminology is coming into use progressively as researchers adopt it.

Under the old model, the forebrain was believed to be mostly basal ganglia, a structure that controls motor function, Kuenzel said. Most structures within the forebrain were assigned names ending in the suffix “striatum” to signify the major tissue type found in the basal ganglia.

The old model suggests that birds never developed a cortex, that area of the brain in mammals in which thinking, learning and memory take place.

“This suggested that there was no cortical-like tissue, which would mean birds had no repertoire of behavior that could be learned,” Kuenzel said. “It suggested they have extraordinary motor function but that behavior is largely instinctive.”

Despite this, Kuenzel said, behaviorists have reported for many years that birds do learn, everything from the songs of songbirds to how to use tools. “And they have good memories,” he said. “They can find seed that they’ve hidden away, and some return to a nest site where they were born the previous year when they migrate north to breed.”

Kuenzel said birds do not have a cortex like humans and other mammals, but they do have cortical-like tissue. “It’s just organized differently,” he said.

By definition, a true cortex requires a structure of six layers of cells. But scientists learned that bird forebrains have considerable amounts of cortical-like clusters of cells covering over the basal ganglia, Kuenzel said.

This structure has been verified repeatedly by powerful chemical and molecular techniques that verify the type of cell and the organization of neural structures, and suggest how they work, Kuenzel said.

For example, he said, tract-tracing allows scientists to trace the pathways from sensory perception, such as light entering the eyes, to the processing centers of the brain where images are analyzed and action taken.

Since the avian forebrain does not contain a true cortex, the scientists settled on “pallium” as the proper term to denote this tissue, Kuenzel said. Pallium denotes a cortical-like brain region. In the new terminology, it replaces the former suffix “striatum” in many forebrain structures.

“Proper nomenclature clears up communication between avian scientists and those studying other vertebrate species,” Kuenzel said. “It also facilitates the use of birds in behavioral studies of learning and cognition.”

INTERNATIONAL ASSISTANCE - Dr. Alexander Jurkevici of Vilnius, Lithuania, visiting professor of poultry science, and Ph.D. student Hongyan Li of Beijing, China, use a cryostat to slice frozen chicken brains into thin slices for research.



Photo by Fred Miller

Immunosensors put the speed in rapid microbial detection



Photo by Fred Miller

A CHILLING EXPERIENCE - Dr. Yanbin Li, professor of biological and agricultural engineering (and poultry science), and Dr. Zunzhong Ye, assistant professor, use a biosensor they developed at the University of Arkansas to test samples of poultry processing chill water for the presence of harmful bacteria.

SPR immunosensors are capable of finding their target bacteria in an hour. The research group is attempting to adapt other technologies, including nanomaterials and microfluidics, to biosensor design and is seeking to improve a final product's sensitivity to finding the bacteria.

The experiments were geared toward the detection of *E. coli* O157:H7, but it can be applied to other pathogens on a variety of foods. "This technology should be ready for any other pathogenic bacteria and for any meats and vegetables," Li said.

Li hopes to develop the technology further based on their five pending patents and to work with industry for transfer of the technology to commercial use in the next two to three years.

FAYETTEVILLE, Ark. – Food processors have ways to rapidly detect whether their products have any pathogenic bacteria on them. The problem is that the definition of "rapid" can mean a matter of hours. Yanbin Li's research team at the University of Arkansas Division of Agriculture is closing in on a way to reduce that to minutes – one hour at most.

The key is the immunosensor. Li, a biological and agricultural engineering professor who leads the project for the Food Safety Consortium, said the team has modified some existing technology with immunosensors to target foodborne bacteria quickly.

Immunosensors are compact analytical devices that use antibodies (to capture target compounds on bacteria) to produce a digital electronic signal that scientists use to determine if a particular pathogen is present. The deadly *E. coli* O157:H7 pathogen has been one target of Li's research.

"We make the sensor very specific and very sensitive," Li said. "We use electrochemical sensing technology. We measure the electrical current. The magnitude of the current is proportional to the cell number of target bacteria. That way we link the electronic signal to the biological signal."

To apply the procedure to foodborne pathogens, Li's group turned its attention to a couple of available technologies used in immunosensors: QCM (quartz crystal microbalance) and SPR (surface plasmon resonance). The QCM technology measures small amounts of particles on an electrode's surface based on its mass, while SPR accomplishes the task based on an optical sensor.

"We have those technologies in the equipment, but they are not designed for the detection of bacteria," Li explained. "They are basically designed for detecting some particular chemical compounds or small molecules substances."

Li's group developed its own protocol to integrate the technology into their immunosensors for biodetection. "We can modify this technology to be able to detect the pathogenic bacteria."

Detecting biological signals and comparing them to electronic signals is difficult because the researchers are looking for ultralow concentrations of bacteria in a sample (fewer than 10 cells per milliliter). Li's group determined that both QCM and

Good bacteria improve bird health and food safety

plan in poultry production is to introduce the beneficial good bacteria into a live bird to drive out the harmful pathogenic bacteria. The federal Food and Drug Administration does not allow undefined cultures to be used in competitive exclusion, so the defined cultures produced by Hargis' research group fill a need for industry.

"Our cultures are different because they can be truly defined and they can be reproduced from specific isolates that are stored back in the freezer," he said. "Then they can be propagated virtually forever."

At the poultry production farm level, the probiotic culture has been administered to chicks through their drinking water and by spray application. In addition to cutting down on pathogens in the live poultry, the culture has also been found in experiments to be effective in increasing the birds' weight, lowering production costs and reducing environmental contamination in poultry houses.

Emphasis on food safety is mostly concentrated at the processing plants where companies employ numerous techniques to eliminate bacterial contamination in the stages before a poultry product is packaged for sale. Processors can find their work made easier if they receive a supply of live birds at the plant that have already been exposed to pathogen-reducing exercises. So producers of live poultry would have significant incentives to use a probiotic culture if it not only reduces pathogens but also provides financial benefits against the usual costs of doing business.

"Our premise has been that if we can do something that provides an economic advantage in addition to reducing foodborne pathogens, then we might see more rapid adoption of the technology," Hargis said. "We've had quite a bit of commercial adoption in the past year. We have several companies that are using the product at least intermittently."

In addition to seeking ways to perfect the probiotic culture, Hargis also wants to pursue more study of its ability to reduce carcass contamination. Some experiments have shown such reductions, but more data are needed.

"*Salmonella* does not occur by spontaneous generation in a processing plant. It comes in with the live animals. I think it's a pretty good bet that reducing *Salmonella* in live animals will end up reducing *Salmonella* in food because that's where it comes from," Hargis explained. "Our focus now is to make the culture better and find other isolates that are more effective."



DR. BILLY HARGIS



Photo by Fred Miller

BENEFICIAL BACTERIA - Ph.D. student Lisa Bielke of Houston, Texas, streaks *Salmonella* culture on a plate treated with lactobacilli, a beneficial bacterium that can be used to treat bacterial infections in poultry gastro-intestinal tracts.

FAYETTEVILLE, Ark. — Some commercial poultry processors have begun using a bacterial culture developed at the University of Arkansas that can sharply reduce the levels of *Salmonella* and *Campylobacter* in live poultry.

This probiotic is helping the poultry industry increase the safety of food products, and poultry science researcher Billy Hargis believes his research team can do more.

"We have not bothered to patent this specific culture because we don't think this is the best we can do," said Hargis, who is working on the Food Safety Consortium project in the UA Division of Agriculture. "We think we can find better cultures. This is just the best we have found so far. We think we can make it more effective."

The culture is unique because unlike previous cultures that have been tested, this is a "defined culture" — entirely derived from a single defined group of bacteria. "They're known organisms, specific isolates that are well characterized," Hargis said.

The probiotic cultures are applied to the concept of competitive exclusion, in which different species compete to coexist. The

Poultry litter offers source of nutrients for soybeans



Photo by Fred Miller

POULTRY LITTER RESEARCH: Research technologist Betsy Murdoch uses a spectrographic instrument to analyze the phosphorus and potassium content of soybean tissue samples from plants grown in test plots fertilized with poultry litter.

FAYETTEVILLE, Ark. — University of Arkansas Division of Agriculture research demonstrates that poultry litter is a viable source of phosphorus and potassium fertilizer for soybeans.

“Use of litter as a nutrient source for soybeans is different from other crops like rice,” said Dr. Nathan Slaton, director of the Arkansas soil testing and research program.

Nitrogen is a key element in fertility studies for other crops. But soybeans are legumes, plants that fix their own nitrogen from the air through a symbiotic relationship with bacteria in the soil. “They’re like little nitrogen factories,” Slaton said.

Slaton and Dr. Chris Tingle, Extension soybean agronomist, applied poultry litter to soybean test plots at different rates based on phosphorus content. Potassium content was also calculated at those rates. The results were compared to inorganic phosphorus and potassium sources applied at the same nutrient rates.

Research at other universities suggests that applying litter on soybeans is a feasible option for disposing of it. But Slaton and Tingle are trying to determine if poultry litter is a suitable substitute for inorganic fertilizers.

“What we’ve seen is that there is little or no difference in plant performance between the litter and commercial fertilizer at the same rates,” Tingle said. “Our tests, so far, show poultry litter is a viable source for phosphorus and potassium.”

Slaton said there can be variation in nitrogen, phosphorus and potassium contents in different loads of poultry litter depending on several factors, including how many flocks were raised before it was cleaned out.

“We recommend routine analysis of poultry litter to determine nutrient content,” he said.

Slaton said the nitrogen content in poultry litter should not be problematic for soybeans and may even be beneficial in some cases.

“The nitrogen in poultry litter tends to boost early season soybean growth,” he said. “When the nitrogen from the poultry litter is gone the nitrogen-producing mechanism in soybean kicks in.”

“The first 30 to 40 days are critical in establishing the relationship between the plant and the bacteria that work to fix the nitrogen,” Tingle said. “We want to be careful that we don’t disrupt that and end up with a nitrogen deficiency.”

“We feel like poultry litter can be used effectively in soybean production,” Tingle said. “Our research will develop recommendations based on phosphorus that growers can count on if they choose to use it as an alternative to inorganic fertilizers.”

'Kiss of the hops' may stimulate broilers

FAYETTEVILLE, Ark. - Poultry scientists at the University of Arkansas Division of Agriculture have found that hops, an herb used in brewing beer, might work as a substitute for growth promoting antibiotics in broiler diets.

UA scientists Susan Watkins and Park Waldroup, along with graduate students Jana Cornelison and Frances Yan, conducted the research at the Division of Agriculture's Center of Excellence for Poultry Science.

Results of the study, published in the *International Journal of Poultry Science*, (Vol. 5 pp. 134-136. 2006) indicated that addition of ground hops to poultry feed improved early growth rate of broiler chicks and reduced the overall feed needed to produce a pound of gain.

Working with Lloyd Rigby, a hops chemist from Yakima, Wash., and John Segal, a leading grower of hops in Grandview, Wash., the Arkansas team conducted a feeding trial in which broiler diets containing either hops or a growth promoting antibiotic were compared along with a control diet with neither treatment.

Although the response from the addition of hops was not as great as that obtained from the antibiotic treatment, it was significantly greater than that of birds fed the control diet.

"Over the past several years we have been exploring a number of alternative products for replacing antibiotics in broiler diets, including many herbs, spices, organic acids, and other similar products. This is the first product that we have found that resulted in performance improvement of this magnitude," Waldroup said.

Waldroup said additional work is needed to determine how consistent the response to hops might be under more stringent growth conditions and any effects on the broiler meat.

"Many herbs and spices may flavor poultry meat, and the fact that hops lend bitterness to beer might mean that it could possibly impart some off flavors to poultry meat," said Waldroup.

"We recognize hops primarily for their role in the brewing industry, and that is precisely the reason we felt that they might



Photo courtesy of USDA/ARS

BEER AND CHICKEN HAVE SOMETHING IN COMMON? -- All beer contains two types of hops. Research suggests herb used in beer might be substitute for growth-promoting antibiotics in broiler diets.

be beneficial in poultry feeds." Waldroup said. "They serve as an antimicrobial to keep beer from spoiling, and there are a number of U.S. patents relating to the use of hops as an antimicrobial for several food products."

Hops (*Humulus lupulus*) also have a long history as an herbal remedy in human medicine.

Steven Ricke named to UA Food Safety Chair

FAYETTEVILLE, Ark. -- Steven C. Ricke, a professor of poultry science at Texas A&M University, was named the first holder of the new Donald "Buddy" Wray Chair in Food Safety and director of the Center for Food Safety in the Institute of Food Science and Engineering at the University of Arkansas.

Greg Weidemann, dean of the Dale Bumpers College of Agricultural, Food and Life Sciences and associate vice president of the U of A System's Division of Agriculture, announced the appointment and Ricke joined the faculty in January 2006.

"Dr. Ricke is one of the leading young scientists in the fields of food safety and microbiology," Weidemann said. "He has an excellent track record of working with colleagues in a variety of disciplines to address food safety issues."

Weidemann added that the Center for Food Safety is designed to facilitate cooperation by University scientists, other agencies and the food industry. "Working together is essential to developing, delivering and implementing new information and technology that will lead to safer products for consumers," he said.

The Center for Food Safety is a unit of the U of A System's statewide Division of Agriculture.

Ricke said, "I look forward to the tremendous opportunities in this appointment for developing an outstanding program that will represent the cutting edge of food safety and microbiology."

The Donald "Buddy" Wray Chair in Food Safety is supported by a \$3 million endowment provided by matching gifts from Tyson Foods and a fund created from the Walton Family Charitable Support Foundation's \$300 million gift to the University in 2002.

Investment earnings from the endowment will be used to support Ricke's teaching and research in the Department of Food Science and the Center of Excellence for Poultry Science as well as the Center for Food Safety.

Two For One Deal: Biodiesel byproduct fuels growth in broilers



Photo courtesy of USDA-ARS website, Keith Weiler photographer

WASTE NOT -- At the Beltsville Agricultural Research Center, quality assurance specialist David Johnson examines a sample of biodiesel while Greg Meyer, driver from a cooperating fuel company, fills a 20,000-gallon tank at a boiler plant. A U of A poultry scientist is studying ways to use glycerine, a byproduct of biodiesel production, as a dietary supplement for broilers.

Results of these studies indicate that glycerine can be used as an energy source for broiler diets, Waldroup said, but additional research is needed to evaluate quality issues associated with its use and the effects on such features as feed texture and pellet quality.

“As the biodiesel industry continues to grow, this should provide additional feed sources for broiler producers and improve profitability of biodiesel production,” Waldroup said.

FAYETTEVILLE, Ark. — Glycerine, a byproduct of biodiesel production, can be used as a dietary supplement for growing broiler chickens, according to research by University of Arkansas Division of Agriculture poultry scientists.

Finding valuable new uses for glycerine will become increasingly important as biodiesel production increases, said Park Waldroup, poultry nutritionist for the U of A Center of Excellence for Poultry Science.

“There is a rapid increase in the production of biodiesel in the United States, with about 354 million gallons produced annually and additional plants under construction that will nearly double U.S. production capacity,” Waldroup said. “Glycerine, a carbohydrate molecule that makes up 10 to 12 percent of a typical fat, is a byproduct of the manufacture of biodiesel from fats and oils.”

The growing production of biodiesel will soon overwhelm traditional uses for glycerine in cosmetics and other products, Waldroup said. So he and his research group are exploring the value of glycerine as an energy source in typical U.S. broiler diets.

“Glycerine is recognized as a safe feed additive,” Waldroup said. “It is a pure calorie source that can provide energy to a body for maintenance and growth.”

In a short-term preliminary study Waldroup and his research group found that they could feed up to 10 percent glycerine to chicks up to 16 days of age without impairing performance. This was followed by a full-term feeding study with chicks grown to market age to evaluate the effects not only on live performance but also on meat quality.

“Results of the study showed that diets with 5 percent glycerine supported good performance, but when 10 percent was added to the diets the flow rate in the feeders were slightly reduced, hampering feed intake,” Waldroup said. “Neither level of glycerine had any adverse effects on meat quality.”

The Future of Animal Agriculture in North America

FAYETTEVILLE, Ark. - According to University of Arkansas poultry economist H.L. Goodwin and fellow economists, animal agriculture in Arkansas, the U.S. and North America is undergoing fundamental change. Technology and production economics are moving the industry toward fewer and larger production units. Concerns about environmental quality are pressuring the industry to find new ways to manage waste. Animal disease and other food safety concerns are forcing the industry to develop better linkages and ways to trace animal products from the farm to the plate.

Open markets are being replaced by contracts and other ways to convey critical information through the food chain. There is growing concern that some segments of the industry may move off shore to reduce costs. This change is not limited to any particular size or type of livestock operation, nor is it limited to the farm. Every facet of the animal food chain from genetics to the retailer and food service outlet is trying to adjust to the rapid pace of change.

The consolidation of the industry has left many rural communities without a viable animal agriculture industry, while some have experienced rapid expansion of the industry with associated social pressures. Land Grant universities, governmental agencies, industry groups and non-profit organizations have all undertaken major efforts to study and explain some facets of this changing industry. However, no organization has compiled a neutral, comprehensive assessment of the future of animal agriculture in North America.

Farm Foundation provided the leadership and framework for animal agriculture stakeholders to review research, examine the pressures and challenges and explore the economic, structural and policy alternatives facing the industry. Division of Agriculture, University of Arkansas scientists are participating in this project. Consequences of key private and public policy decisions are outlined in an eight-part document were presented to policy makers in Canada, the U.S. and Mexico in Spring, 2006. The broad areas covered were:

- Economics and coordination of animal production, processing and marketing
- Environmental issues
- Animal health and food safety
- Animal welfare
- Consumer demands
- Labor and community issues
- Global competitiveness and trade

The total impact of animal agriculture in Arkansas is substantial. Animal production and processing accounted for \$2.7 billion of labor income in 2001; 111,548 jobs were attributable to these activities and \$4.1 billion in value-added were contributed to the State's economy.

Authorship of the Food Safety and Animal Health section and leadership in an Environmental section of the report, as



Stock photo

THE FUTURE OF ANIMAL AGRICULTURE-- University of Arkansas poultry economists have been studying how environmental concerns, waste management, cost reduction, industry consolidation, food safety and other issues have affected the long-term viability of animal agriculture in our state and around the nation. UA scientists participating in this project outlined their findings to policy makers in North America this past spring.

well as in-depth assessment and input in the remaining sections, should ensure Arkansas' interests are well represented in the final document and will provide a high-profile opportunity to showcase Division of Agriculture expertise nationally and internationally.

Collaborating Scientists: Dr. F. Dustan Clark, Janie Hipp, Public Policy Specialist and Sandra Hamm, Research Specialist, Department of Agricultural Economics & Agribusiness, University of Arkansas.

Funding:
Farm Foundation
Division of Agriculture, University of Arkansas

Impacting Food Safety: Fighting foodborne illness



FIGHTING FOODBORNE PATHOGENS -- Two men check over a grilled chicken leg to see if it's done. Some foodborne illness cases have been linked to the handling of under cooked or raw poultry and not following proper handling procedures. Hopefully by reducing *Campylobacter jejuni* contamination in foods, we can help make our food supply safer for consumers who do not follow proper handling procedures.

FAYETTEVILLE, Ark. - *Campylobacter jejuni* is reportedly responsible for causing a large number of cases of foodborne illness each year. Many of the previous cases have been linked to eating or handling under cooked or raw poultry. Genetic sequencing has shown *C. jejuni* lacks the genes necessary to survive stress associated with processing and storage. But given the prevalence of the disease, it is apparent *Campylobacter* has some unknown mechanisms that are available for survival. Biofilm formation, stress-hardening and toxicity are mechanisms used by other bacteria and may be methods *Campylobacter* uses. By investigating the survival methods *Campylobacter* uses, information could be gained to reduce incidences of Campylobacteriosis, and make poultry and poultry products safer.

What have we done?

Initially, 150 *C. jejuni* isolates obtained from chickens, turkeys, and humans were screened for the ability to form a biofilm. Results indicated *C. jejuni* is a very poor biofilm initiator. Therefore, Dr. Mike Slavik and his research team investigated the ability of *C. jejuni* to incorporate into a pre-established biofilm of poultry significant bacteria. Thirty strains of bacteria were isolated from poultry environments and found to vary in biofilm architecture by isolate. However, all the isolates formed much larger biofilms under flowing conditions. For this reason, flowing biofilms captured *C. jejuni* better than static. Using several cell signaling assays, Slavik found cell signals were present, but did not induce *C. jejuni* biofilm formation. Therefore, the researchers concluded the interactions in their experiments were strictly physical. In addition to biofilm experiments, studies investigating the ability of *C. jejuni* to

survive stress were done to determine specific stress mechanisms that may help the bacterium survive. After exposing the isolates to acid, starvation, or aerobic stress, whole proteome analysis was done using 2D-gel electrophoresis and the variation in protein expression before and after stress was evaluated. The ongoing stress studies have shown *Campylobacter* isolates that survive a stress are more resistant to subsequent stress conditions. Furthermore, the results of the proteomic study indicate protein expression varies between stressed and non-stressed isolates. Currently, proteins found to be up-regulated due to stress are being sequenced for identification. *C. jejuni* isolates from multiple sources are also being studied for their possession of a specific toxin gene. Slavik's team is determining the prevalence of the gene as well as sequencing and comparing the homology of the gene. The correlation of the gene with previous research concerning cytotoxicity data is also being done. The use of the gene as an indicator of pathogenic *C. jejuni* on poultry products is being investigated.

What is the payoff?

Many outbreaks of foodborne illness result from contamination of foods from a common source. The information gained from these biofilm and stress studies will give insight into methods to reduce *C. jejuni* in the environment and prevent cross-contamination. The toxin studies will also give valuable epidemiological information and possibly provide a tool for detecting pathogenic strains of *C. jejuni*. Reducing *C. jejuni* in the environment and improving detection methods can decrease the prevalence of campylobacteriosis, benefiting both producers and consumers.

Optimal nutrition programs increase breeder hen fertility, hatching egg production and decrease feed costs

FAYETTEVILLE, Ark. - A key problem associated with the feeding and management of breeder strains producing ultra high yield progeny is a significant reduction in fertile hatching egg production, which has increased the feed costs per hatched chick.

Dietary programs have a direct effect on male fertility and hatching egg production, but limited work on female fertility has been conducted. Key factors that may affect female fertility during a production period may be weight, body composition and age.

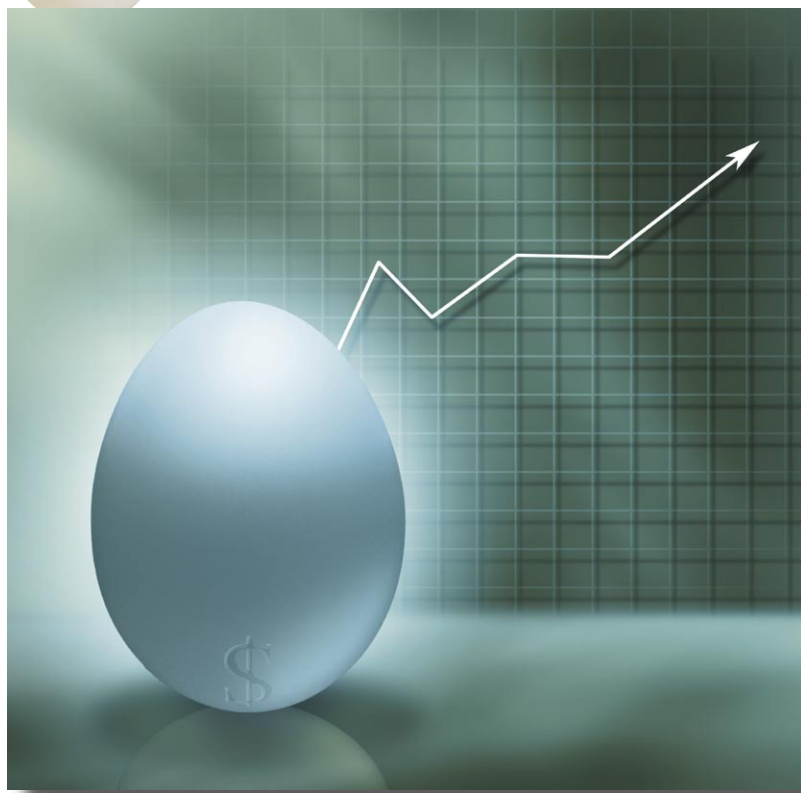
Dietary programs that provide optimum egg production are utilized for breeder hens because there is a lack of information suggesting different requirements for fertility.

Dr. Craig Coon, UA poultry nutritionist, recently conducted a feeding study to determine the requirements for broiler breeders for crude protein and amino acids for maintenance and production. Breeders were shown to require 13% crude protein containing ideal amino acid levels providing approximately 20 g per day for optimum production and fertility.

The industry normally feeds a 16% breeder I diet and a 15.5% breeder II diet providing as much as 26 g of protein per day. This research shows that breeders fed 16% protein diets had an average of 82% fertile hatching eggs compared to 90.5% fertile hatching eggs with a 13% protein diet.

A 13% crude protein level in breeder I and breeder II diets would decrease the feed costs approximately 4 dollars per ton and 25 cents per breeder during the production period.

The feed costs per dozen hatching eggs could be lowered by approximately 2 cents per dozen and the number of fertile hatching eggs increased 8 % from an average of 145 per breeder to 159 hatching eggs.



The increased number of hatched chicks per breeder could increase by 10 increasing revenue by \$3.00 per breeder. The additional hatched chicks or hatching eggs are worth significantly more than just the increased monetary value of chicks.

The continuing growth of the poultry industry in Arkansas and the U.S. will require that breeders increase the supply of quality chicks for grow-out to support the world-wide increasing demand for poultry meat.

Phosphorus retention assay can help reduce overfeeding

FAYETTEVILLE, Ark. - The cost of feed for broiler breeder flocks is approximately 4.7 cents per egg and 5.5 cents per chick. A large portion of this cost is from key nutrients that are expensive such as protein, energy and phosphorus. Improved methods of determining energy and phosphorus requirements of a broiler breeder flock could be used in the industry to reduce feed costs. Also, the phosphorus content of poultry litter is important with regard to its potential use as a fertilizer.

Research by Dr. Craig Coon at the University of Arkansas, and researchers at the University of Minnesota has shown that phosphorus requirements of poultry need to be evaluated in a different way in order to decrease overfeeding phosphorus and lower feed cost. A phosphorus retention assay has been developed over a period of 10 years that will help nutritionist access the true need for dietary phosphorus and to determine the most economical levels to feed.

The entire poultry industry will gain from having a system by which nutritionists can know how much feedstuff phosphorus will be retained and how much will be lost in the excreta. The feeding of specific levels of phosphorus may cause positive responses for performance but there will be known phosphorus losses in the excreta. Economic decisions can be made about the optimum level to feed for maximum performance if integrators know the overall losses of phosphorus and possible penalties for those losses.



DR. CRAIG COON

Photo by Karen Eskew

Improving the resistance of broiler lungs to respiratory problems

FAYETTEVILLE, Ark. - Broiler chickens are exquisitely sensitive to respiratory problems because their lung capacity is only marginally adequate to support optimal performance under the best conditions.

All animal respiratory systems are continuously exposed to environmental factors and pathogens that activate pulmonary immune processes resulting in symptoms of respiratory inflammation that cumulatively attenuate growth and productivity of broilers.

Pulmonary responses to activation of the innate immune system vary widely among individual broilers, but insufficient knowledge currently exists to confidentially establish the basis for such variability.

University of Arkansas poultry scientists Drs. Gisela Erf and Bob Wideman are integrating the research of immunology and physiology to examine the hypothesis that such variability among individual broilers appears primarily to reflect innate (genetically predetermined) variability in the relative proportions of profiles of chemical mediators produced when the innate immune system is activated.

Evaluations of multiple broiler lines derived from diverse sources consistently demonstrated that selection for a robust pulmonary capacity dramatically reduces the risk of mortality associated with triggering innate immune system activities. However improving the pulmonary capacity did not consistently alter the extent of variation among individual broilers in their responses during inflammatory episodes.

It remains the researchers' hypothesis that such variability among individuals appears primarily to reflect genetically predetermined variability in the relative proportions or profiles of chemi-

cal mediators produced when the immune system is activated.

Studies are underway to identify key-mediators responsible for the observed variation in pulmonary responses to inflammatory agents.

The long-term goal is to provide broiler geneticists with the foundational knowledge needed to select more robust and productive genetic stocks.



Photo by Karen Eskew

POULTRY HEALTH -- Dr. Bob Wideman attaches a heart monitor to a broiler during the Poultry Science Youth Conference to demonstrate to participants how health problems affect poultry and how they are monitored. Wideman and Dr. Gisela Erf are currently researching pulmonary responses to activation of the innate immune system. Wideman, a physiologist and Erf, an immunologist, have combined forces and research areas to work together on an important issue in poultry -- lung health.

Control of Coccidiosis in turkeys an ongoing battle

FAYETTEVILLE, Ark. - A protozoan parasite first described from the United States in 1952 has been identified in turkey flocks in northwest Arkansas.

The parasite, *Eimeria meleagridis*, was thought to be non-pathogenic but recent studies have shown that it is capable of depressing the weight gain of young turkey poults.

The life cycle is complicated with at least four generations of reproduction of the protozoan parasite in the intestine of the bird. Several species of *Eimeria* are known to cause *coccidiosis* in turkey poults.

This research, which is being spearheaded at the University of Arkansas by Dr. David Chapman, adds one more species that needs to be considered if this disease is to be successfully controlled.



Photo submitted

TURKEY HOUSE -- Control of Coccidiosis, a disease in turkeys, is an ongoing battle for researchers. Dr. David Chapman, UA poultry scientist helps spearhead efforts in eradicating this disease.

Efficient production strategies for commercial pheasant production

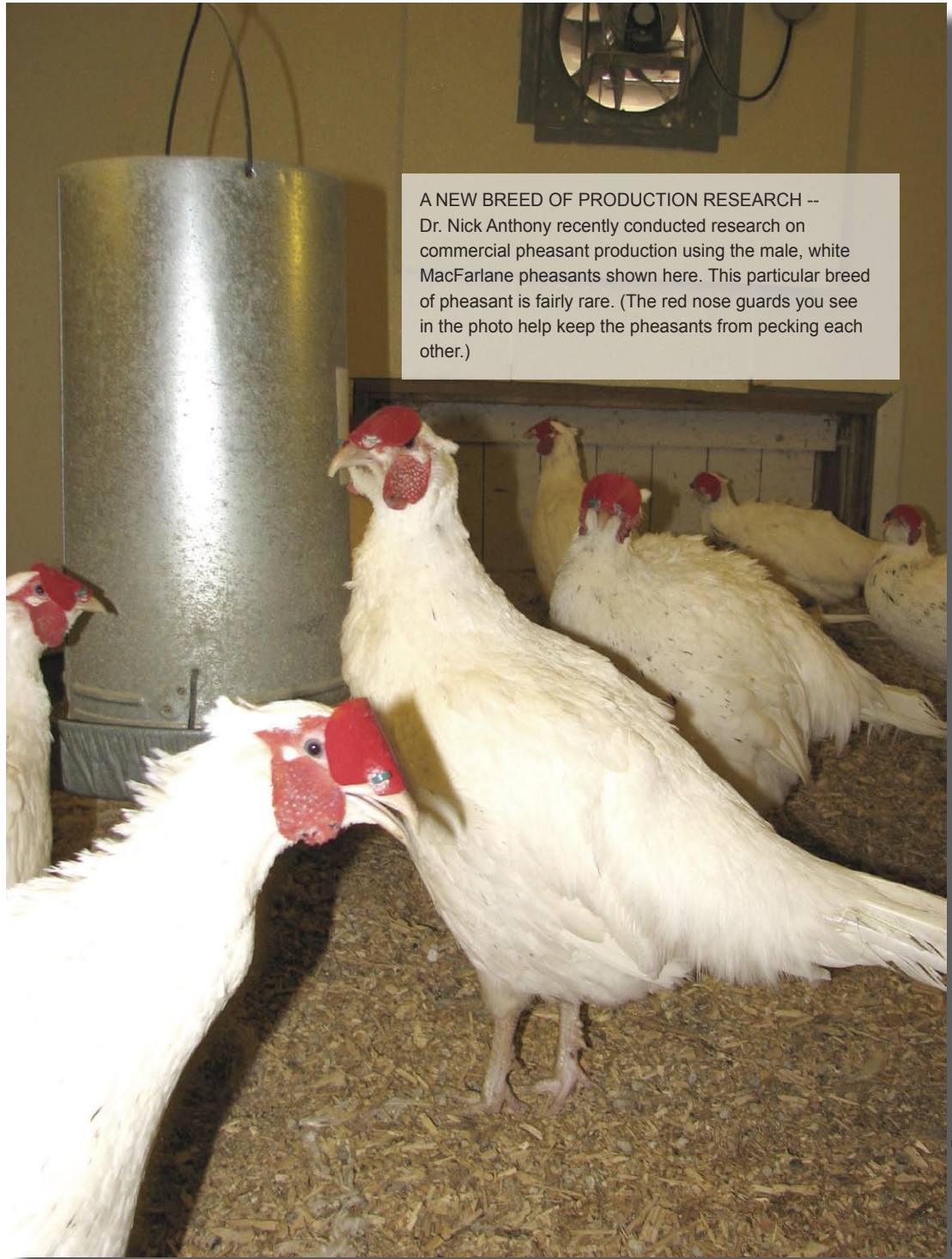
FAYETTEVILLE, Ark.

- Because of the increasing acceptance and demand for pheasant products in the national and international markets there has been a substantial shift from processing release birds to that of weight selected high yielding pheasants. This shift has created new challenges for the grower who is trying to maximize facility efficiencies while not jeopardizing bird fitness.

Ongoing research has revealed that stocking densities can be substantially increased without significant reduction in performance. Unfortunately, as densities increase, so do the opportunities for bird to bird interactions that are often quite aggressive. Debeaking and peeping are two strategies employed to curb the degree of damage inflicted by encounters. In addition, since the slaughter market has been driven by release bird processing, little is known about the normal growth and efficient growth of the commercial pheasant.

A study was conducted by UA poultry scientist Dr. Nick Anthony and his laboratory researchers to characterize the normal growth and development of the commercial pheasant from hatch to 20 weeks of age. Sequential slaughters from 10 to 20 weeks of age allowed for the identification of the economically efficient production ages. In addition, it was possible from this study to determine if debeaking and peeping treatments had an impact on production traits.

Several very important observations were made over the course of this research project. In fact, it was found that birds could be processed one month earlier than thought since growth had plateaued and feed conversion spiked. Earlier processing allows for more efficient utilization of facilities as well as concomitant reductions in feed and utility costs. It was observed that body weight gains beyond 16 weeks were associated with carcass fat rather than beneficial muscle growth. These results have been essential for the developing selection programs designed to maximize response.



A NEW BREED OF PRODUCTION RESEARCH -- Dr. Nick Anthony recently conducted research on commercial pheasant production using the male, white MacFarlane pheasants shown here. This particular breed of pheasant is fairly rare. (The red nose guards you see in the photo help keep the pheasants from pecking each other.)

Photo by Karen Eskew

Award-winning research by students and faculty in Poultry Science



Photo by Jeff Erf

Dr. Gisela Erf
Winner of the
Helene Cecil Leadership Award
from the Poultry Science Association



Photo by Mark BuddenFASS

Dr. William Huff
Winner of the
National Chicken Council's
Broiler Research Award

AUBURN, Ala. - Two University of Arkansas faculty members and three graduate students took top honors at the Poultry Science Association's (PSA) annual meeting in July 2005 at Auburn University. The awards are for research sponsored by the Center of Excellence for Poultry Science in the University of Arkansas Systems' statewide Division of Agriculture.

Gisela Erf received the Helene Cecil Leadership Award. This award of \$3,000 and a plaque is given to a female PSA member for scientific contributions in the field of poultry science or for significant leadership in the promotion or development opportunities for women in poultry science. Erf's research is in avian immunology with a specialization in cell-mediated immunology. She teaches graduate and undergraduate courses and is an academic advisor and Honors Program mentor.

William Huff, a microbiologist with the USDA Poultry Production and Product Safety Research Unit, and an adjunct member of the UA faculty, was presented with the National Chicken Council Broiler Research Award and \$1,500. The award is given for research that has a strong economic impact on the broiler industry. His research is on therapeutic utilization of bacteriophages to reduce pathogens in poultry.

Poultry science graduate students winning awards at PSA were Marc DeBeer, Hilary Pavlidis and Arijit Saha (see photos p.25).

DeBeer, a doctoral student from Durban, South Africa, won the Outstanding Graduate Student Paper award in the area of nutrition for his paper, "The effect of feed restriction programs on body weight, frame size, flock uniformity and in vitro lipogenesis in broiler breeder hens." His major professor is Dr. Craig Coon.

Pavlidis, a doctoral student from Virginia Beach, won an Outstanding Graduate Student Paper award in the area of poultry breeding and genetics for her paper, "Broiler growth and development as influenced by divergent selection for ascites incidence." This is Pavlidis' second time to take top honors at PSA for her research, the first time was in 2002 in Delaware as a master's student. Her major professor is Dr. Nick Anthony.

Saha, a doctoral student from New Delhi, India, received an Outstanding Graduate Student Paper award in the area of products and processing for his paper, "Effect of chronic heat stress on meat quality parameters of two commercial broiler strains." His major professor is Dr. Casey Owens.

A close-up photograph of a white plastic basket filled with numerous white eggs. The basket has a grid-like pattern of square holes. The eggs are piled together, with some in sharp focus and others blurred in the background, creating a sense of depth. The lighting is soft and even, highlighting the smooth texture of the eggs.

sponsored support

*collecting our resources
together in one basket
to make a difference*

sponsored support

Breakdown of sponsored support dollars

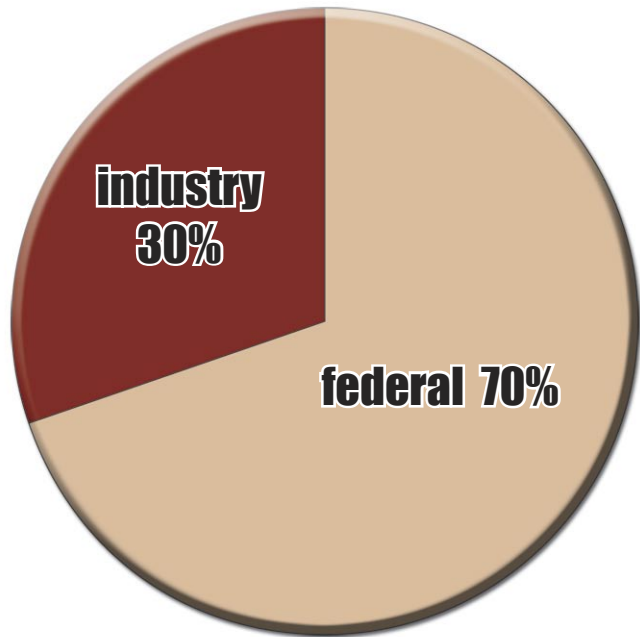
Federal.....\$1,272,007
Industry \$545,110

Total attributed to
Poultry Science
Department..... \$1,817,117

Amount spent on
poultry research
attributed to other
departments\$502,945*

TOTAL AMOUNT SPENT ON POULTRY-RELATED RESEARCH

\$2,320,062



* Because of interdisciplinary research and faculty member affiliation, some research dollars are given credit to other departments on campus, but the research itself is on poultry and poultry-related industries.

A close-up photograph of a single, smooth, golden egg resting in a nest made of dry, brown straw. The nest is circular and sits on a light-colored, textured surface. The lighting is warm, highlighting the texture of the straw and the metallic sheen of the egg.

teaching highlights

*laying the golden egg
of knowledge*

Faculty receive Honorary American FFA Degrees



Photo by Karen Eskew

DEGREE RECIPIENTS -- From left, Jason Emmert and Jerry Wooley, faculty members in the Department of Poultry Science, both received Honorary American FFA Degrees during the FFA's national convention held Oct. 26-29 in Louisville, Kentucky.

FAYETTEVILLE, ARK. ~ Jason Emmert and Jerry Wooley, faculty members in the poultry science department of the University of Arkansas, Division of Agriculture, both received Honorary American FFA Degrees during the FFA's National Convention held in Louisville Oct. 26 - 29, 2005.

The National FFA Board of Directors receives nominations from its FFA membership and awards individuals "who have gone beyond the valuable daily contributions to make an extraordinary long-term difference in the lives of students, inspiring confidence in a new generation of agriculturists."

Emmert and Wooley have served on the National FFA Poultry Judging Career Development Event (CDE) Committee for seven and five years, respectively. Emmert was recently named superintendent of the event.

Throughout the school year, both faculty members travel around the state teaching interested high school students how to judge poultry through a series of hands-on workshops.

In conjunction with Division of Agriculture's Cooperative Extension Service, Emmert and Wooley hosted over 30 high school agriculture teachers for a two-day workshop last summer, which covered the rules and techniques used in poultry judging.

Emmert is also working on a web site to further assist students and educators in poultry judging curriculum and hopes to make poultry judging a part of each high school's agriculture program.

Emmert serves as the coach of the U of A's poultry judging team and has twice led his team to first place honors at the National Collegiate Poultry Judging Contest.

Congratulations to both of these individuals for receiving such a high honor from a well-respected organization. Their service to the poultry industry by furthering knowledge to high school students is exemplary.

Burascos establish a scholarship fund

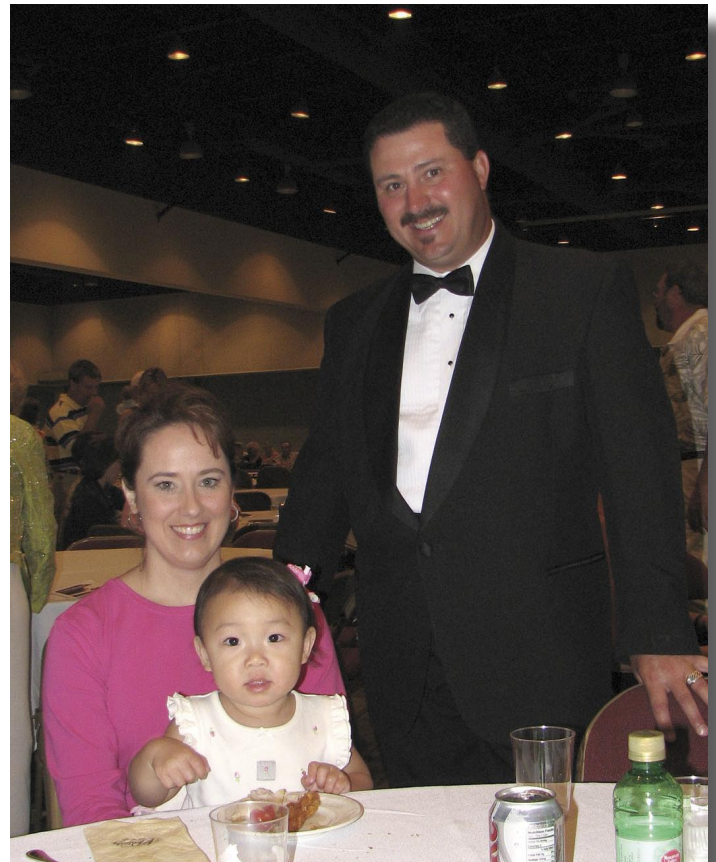


Photo by Karen Eskew

SCHOLARSHIP ESTABLISHED -- Carmen Burasco holds her daughter Sophia while husband Shannon Burasco stands during the Poultry Festival in Little Rock. This generous husband and wife team have established a scholarship in the Department of Poultry Science at the University of Arkansas. Both are well-known in the poultry industry and have been long-term supporters of the program.

FAYETTEVILLE, ARK. ~ Long-time poultry department supporters Shannon and Carmen Burasco recently established a scholarship fund for the benefit of the Department of Poultry Science in the Dale Bumpers College of Agricultural, Food and Life Sciences at the University of Arkansas.

This gift from the Burascos will go to deserving students with an interest in a profession related to poultry science.

Shannon is the western regional business manager for Aviagen North America. He was raised on a broiler farm in Farmington and graduated from the University of Arkansas in 1993, majoring in Poultry Science.

The department would like to thank Shannon and Carmen for their generosity and genuine interest in our program.

Shannon is currently serving as President of the Board of Directors for the U of A's Poultry Science Alumni Organization. He was also recently elected to serve as a member of the Dale Bumpers College of Agricultural, Food & Life Sciences Alumni Board.

Shannon and Carmen reside in Springdale with their daughter, Sophia.

Students win during the International Poultry Scientific Forum in Atlanta



Photo by Karen Eskew



Photo by Karen Eskew

AND THE WINNERS ARE - (Above left) Fausto Solis de los Santos from the Dominican Republic and Valerie Brewer from Prairie Grove both won presentation awards in Atlanta at an international scientific forum. (Above right) Carol Ojano-Dirain from Cagayan, Philippines, shows off her Alltech Manuscript Award.

ATLANTA, Ga. ~ Three students from the Department of Poultry Science at the University of Arkansas competed and won during the International Poultry Scientific Forum (IPSF) sponsored by the Southern Poultry Science Society, the Southern Conference on Avian Diseases and the U.S. Poultry and Egg Association held in Atlanta Jan. 23-24, 2006.

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 and this was the second year in a row for her to win this prestigious honor. Her major professor is Dr. Walter Bottje.

Fausto Solis de los Santos, a Ph.D. student from Santiago City in the Dominican Republic, won the Outstanding Research Presentation Award in the area of physiology and pathology for his paper on gut development in turkey poults. De los Santos is a Fulbright Scholar and his major professor is Dr. Dan Donoghue.

Valerie Brewer, a junior poultry science major from Prairie Grove, won the Outstanding Research Presentation award in the area of processing and products for her paper on phase-feeding in broilers. Brewer had to compete against master's and Ph.D. students from across the nation to win this award. Drs. Jason Emmert and Casey Owens both assisted Brewer with her project.

Graduate students win big at International Meeting for Poultry Science Association

Poultry science graduate students winning awards at the Poultry Science Association's Annual Meeting in 2005 were Marc DeBeer, Hilary Pavlidis and Arijit Saha. Their papers were highlighted in the research section of this annual report and their photos are shown below. Congratulations to these outstanding poultry science graduate students.



Photo by Karen Eskew

MARC DeBEER -- DeBeer, a doctoral student from Durban, South Africa, won an award for his research area of nutrition. His major professor is Dr. Craig Coon.



Photo by Karen Eskew

HILARY PAVLIDIS -- Pavlidis, a doctoral student from Virginia Beach, won an award for poultry breeding and genetics. Her major professor is Dr. Nick Anthony.



Photo by Karen Eskew

ARIJIT SAHA -- Saha, a doctoral student from New Delhi, India, won an award for poultry products and processing. His major professor is Dr. Casey Owens.

Poultry Science program receives donation from Harold E. Ford Foundation to help with recruitment

FAYETTEVILLE, ARK. – The University of Arkansas Department of Poultry Science received a donation of \$16,551 from the Southeastern Poultry and Egg Association Harold E. Ford Foundation in January 2006.

The foundation, named for a former executive with the U.S. Poultry and Egg Association, promotes advancement of the poultry industry through education and training. Dr. Walter Bottje, department head, said the gift will help support recruitment efforts such as the annual Poultry Science Youth Conference, the youth broiler show at the Arkansas State Fair and in-service training for faculty.

PRESENTATION -- James Bell (left) president of Cobb-Vantress, Inc., and a UA alumnus ('76) presents a check for \$16,551 to Jason Emmert, scholarship coordinator for the UA Department of Poultry Science, on behalf of the Southeastern Poultry & Egg Harold E. Ford Foundation. Funds donated are to be used in recruitment of students to the department.



Photo by Karen Eskew

Outstanding Senior and Graduate Student for the Department of Poultry Science

FAYETTEVILLE, ARK. – During the Honors Day Convocation held April 20, 2006, for the Dale Bumpers College of Agricultural, Food & Life sciences, two students from our department were honored. Ixchel Reyes-Herrera, Ph.D. student of Dr. Dan Donoghue was named Outstanding Poultry Science Graduate Student of the Year and Tamara Leonard, senior poultry science major and transfer student from Crowder College, was named Outstanding Poultry Science Senior of the Year.

Congratulations to these individuals on their accomplishments.

SIMPLY OUTSTANDING
-- Ixchel Reyes-Herrera, shown right, was named the Outstanding Graduate Student for Poultry Science for 2005-2006 at the Honors Day Convocation held April 20, 2006.



Photo by Karen Eskew



Photo by Karen Eskew

ALSO OUTSTANDING -- Dr. Susan Watkins (left) faculty member in the Department of Poultry Science points something out to her student worker Tamara Leonard, senior poultry science major. Leonard was named the Outstanding Senior Poultry Science Major for 2005-2006 at the Honors Day Convocation held April 20, 2006.

Kanters Special Products donates \$1,000 to the Poultry Science Club



Photo by Karen Eskew

PASSING THE CHECK -- Jim Gammil of Kanters Special Products (left) hands a check to Valerie Brewer, poultry science club officer. The check was a donation to the Poultry Science Club in the amount of \$1,000. Thank you Kanters Special Products for your generosity and support! The Poultry Science Club is a service organization that has approximately 75 members. Donated funds are used in service projects, to host educational meetings, to send students to Atlanta for the International Poultry Exposition and for the annual Poultry Science Club banquet.

Poultry Science Students place third in product innovation competition



Photo by Fred Miller

WINNERS -- From right, Valerie Brewer and Ashley Swaffar, both junior poultry science majors when they competed, present their product "Chicken Noodles" to the judges during the Ozark Food Processor's Association Food and Beverage Innovations Competition. The students took home third place and \$500 cash for their efforts. Brewer is a graduate of Prairie Grove High School and Swaffar is a graduate of Farmington High School. The students will graduate in May 2007 and both intend to stay at the University of Arkansas and pursue graduate studies in poultry science.

Other student highlights in 2005-06:

GAMMA SIGMA DELTA POSTER COMPETITION:

Three students in poultry science competed and won during the Gamma Sigma Delta Poster competition in 2006. Valerie Brewer, student of Dr. Jason Emmert, took a first place; Fei Liu, student of Dr. Yanbin Li's received a second place; and, Madhukar Varshney, also a student of Dr. Yanbin Li's, took a third place.

FOOD SAFETY CONSORTIUM POSTER COMPETITION:

Abani Pradhan, graduate student of Dr. Yanbin Li, took first prize from the Food Safety Consortium for his poster during their October 2005 annual meeting.

DEPARTMENTAL REPRESENTATIVES:

Five poultry science majors were chosen to serve as Departmental Representatives by Gary Davis, undergraduate recruiter. They are Miranda Bowen, Valerie Brewer, ReGina Finley, Ashley Swaffar and Neda Tilley.

COLLEGE AMBASSADORS:

Ashley Swaffar, a senior poultry science major from Farmington, is serving as the Senior Ambassador for the College Ambassador program run by the Dale Bumpers College of Agricultural, Food & Life Sciences.

POULTRY GRADUATE ORGANIZATION WINS AWARD:

The Poultry Science Graduate Student Association (PSGA) won the 2005 Outstanding Service Project of the Year Award from the Registered Student Organization at the University of Arkansas.



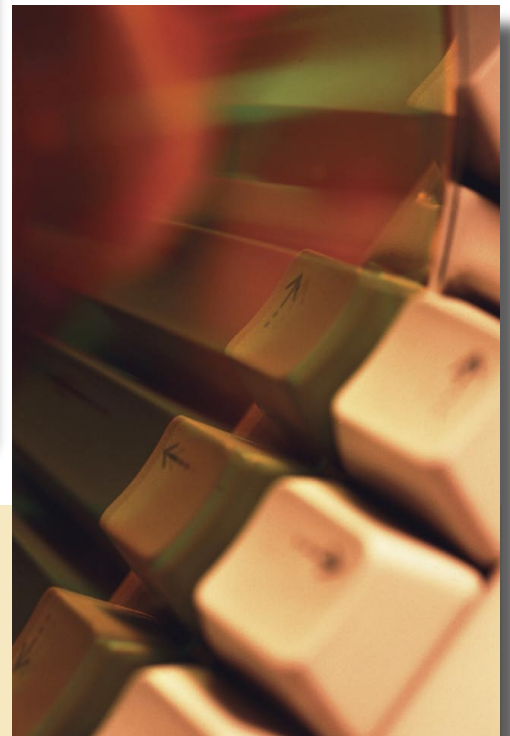
Food Toxicology Web Based, Distance Education Course for the Food Safety & Quality Graduate Program



FAYETTEVILLE, Ark. - Dr. Donoghue, with the assistance of his Ph.D. student Ixchel Reyes-Herrera, has developed a new Food Toxicology course for the Distance Education Masters of Science, Agriculture and Life Sciences Food Safety Masters Program.

This course will focus on the types of food toxicants, their importance in food safety and will explore regulations to control toxicants in the food supply.

In the future, courses such as these may become extremely important to industry personnel for on-the-job training.



Distinguished Doctoral Fellowships or Doctoral Academy Fellowship recipients in Poultry Science

FAYETTEVILLE, Ark. - The Department of Poultry Science at the University of Arkansas is pleased to announce our Distinguished Doctoral Fellowship and Doctoral Academy Fellowship recipients for the 2005 - 2006 fiscal year. Fellowships for these students, all Ph.D. candidates, are provided by a gift from the Walton Family Charitable Trust and are available to the students for four whole years. The students are:

- Stacy Higgins - Distinguished Doctoral Fellowship
- Jack Higgins - Distinguished Academy Fellowship
- Ixchel Reyes-Herrera - Distinguished Academy Fellowship
- Leona Calhoun - Distinguished Academy Fellowship

Congratulations to these doctoral candidates!



degrees conferred

Congratulations to the following students who completed their studies...

UNDERGRADUATES:

December 2005

Steven Culwell

Spring 2006

Derek Allen

Nathan Allen

Kristin Bateman

Zachary Hollowell

Tamara Leonard

Sarah Sossamon

Sarah Villines

Mindy Waddell

Austin Williams

GRADUATE STUDENTS:

December 2005

Olivia Bowen, Masters

Robin Jarquin Torres, Masters

Megharaja K. Manangi, Ph.D.

Spring 2006

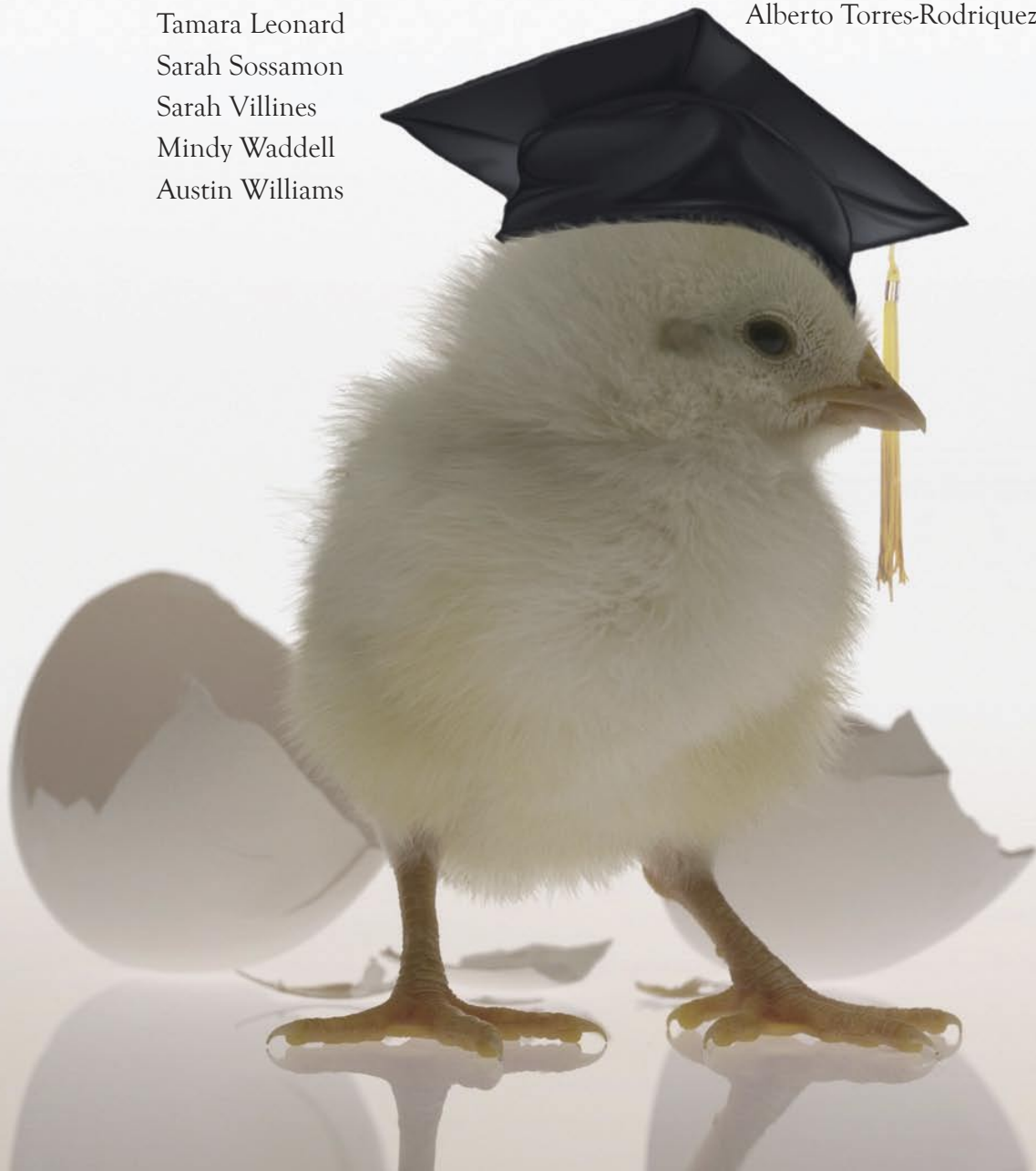
Lisa Bielke, Ph.D.

Anne Fanatico, Ph.D.

Jianwei Lu, Ph.D.

Hilary Pavlidis, Ph.D.

Alberto Torres-Rodriquez, Ph.D.



scholarship recipients



<u>STUDENT</u>	<u>NAME OF SCHOLARSHIP</u>
Avey, Kyle	Henry B. Shreve, Poultry Science
Achey, Lileith	Randal Tyson Memorial
Adams, Luke	James Whitmore and Poultry Science
Airola, Kaitlin	Randal Tyson Memorial
Allen, Derek	Poultry Science
Allen, Nathan	Allied Industry, Randal Tyson Memorial
Bateman, Kristin	Edmiston, Randal Tyson Memorial
Biery, Dustin	Allied Industry
Blair, Samantha	Randal Tyson Memorial
Bowen, Miranda	Poultry Science
Brewer, Valerie	Feed Manufacturer's, Poultry Science
Briggs, Jonathan	Poultry Science
Brink, Racheal	Poultry Science
Brown, Tonya	Randal Tyson Memorial
Craighead, Linda	Poultry Science
Criswell, Amanda	Poultry Science
Davis, Brookee	Allied Industry, Randal Tyson Memorial
Deakins, Will	Randal Tyson Memorial
Dixon, Drew	Darryl & Peggy Greene, Poultry Science
Finley, Regina	Randal Tyson Memorial
Hancock, Amanda	Allied Industry
Harger, Rachel	Grover Harris, Poultry Science
Harvey, Brian	Allied Industry
Haynes, Thomas	Poultry Science
Hemminger, Candy	Poultry Science
Heustess, Joseph	Poultry Science
Hollowell, Zach	Feed Manufacturer's, Poultry Science
Huff, Jeremy	Randal Tyson Memorial
Joseph, Peronne	Poultry Science
Juenger, Jessica	Allied Industry, Randal Tyson Memorial
Khilling, Stephen	Poultry Science
Lasater, Austin	Ed Stephenson, Poultry Science
Leonard, Tamara	Feed Manufacturer's, Poultry Science
Martin, Cody	Randal Tyson Memorial
Mason, James	Randal Tyson Memorial

<u>STUDENT</u>	<u>NAME OF SCHOLARSHIP</u>
Norton, Megan	Poultry Science
Pennington, Brittany	Poultry Science
Powell, Shannon	Poultry Science
Reeves, Ashley	Poultry Science
Renner, Kaitlin	Poultry Science
Roberts, Cynthia	Randal Tyson Memorial
Rodriguez, Mikaela	Randal Tyson Memorial
Rowland, Amanda	Randal Tyson Memorial
Rowland, Emily	Randal Tyson Memorial
Sallee, Clayton	Randal Tyson Memorial
See, Brian	Poultry Science
Shackelford, Spencer	Randal Tyson Memorial
Snodgrass, Kyle	Poultry Science
Stamps, Elizabeth	Randal Tyson Memorial
Stark, John	Randal Tyson Memorial
Swaffar, Ashley	Allied Industry
Swonger, Sidney	PSA '92, Randal Tyson Memorial
Thompson, Jada	Allied, Randal Tyson Memorial
Tilley, Neda	Poultry Science
Varvil, Megan	Poultry Science
Waddell, Mindy	Talmadge Nelson, Poultry Science
Wallace, Kayla	Poultry Science
Warren, Jamie	Poultry Science
West, Jeffery	Poultry Science
Whitlow, Joshua	Richard Forsythe, Poultry Science
Williams, Austin	Hubbard, Randal Tyson Memorial
Young, Nicole	Poultry Science

Because of tremendous scholarship support from our many resources, this fiscal year, the Department awarded:

\$146,309.00

in scholarship money to our students

extension highlights

offering a helping hand



project results



DR. FRANK JONES
Extension Section Leader

- Continued to provide technical editing for *Avian Advice* (an Extension publication).
- Coordinated a week long international short course involving participants from six different countries.
- Continued leadership in the HACCP Roundtable.
- Taught and hosted the National Egg Products School which was held at the Center of Excellence for Poultry Science.
- Co-Chaired (with Dr. Steve Ricke) the Food Safety Consortium Symposium held in Fayetteville. Proceedings from this symposium are scheduled to be published by the University of Arkansas Press next year.
- Completed and published a scientific review of arsenic and its use in poultry feeds.



DR. KEITH BRAMWELL
Reproduction

- Conducted numerous field trials evaluating the effects of egg weight variation and egg shape on hatchability.
- Evaluated the effects of incubation temperature on broiler growth.
- Correlated external characteristics in breeder males with semen production to increase flock fertility.
- Continued work on identifying the causes of decreased hatch of fertiles.
- Continued research on the effects of pullet growth characteristics on breeder performance.



DR. DUSTAN CLARK
Poultry Disease, DVM

- Major educational efforts on Avian Influenza (Bird Flu), Biosecurity and Agroterrorism aimed at a wide variety of groups including the news media.
- Continued involvement with training in the National Poultry Improvement Plan Blood Testing School and the Poultry Federation Poultry Health Advisory Committee.
- Involved with monitoring West Nile Virus using backyard chicken flocks as sentinels.
- Substantial involvement in animal disease emergency preparedness.
- Teaches avian anatomy and biology course.



DR. H.L. GOODWIN
Poultry Economist

- Studies associated with the Ozark Litter bank are helping growers make decisions regarding poultry litter application/removal from contentious watersheds in Northwest Arkansas.
- Goodwin was also named president-elect of the Southern Agricultural Economics Association.

project results



DR. JOHN MARCY
Food Safety, HACCP

- Established Culinary Training Classes at the Center of Excellence for Poultry Science for Research and Development professionals from poultry companies.
- Conducted Food Safety Training for food service workers from all Arkansas State Parks.
- Continues to provide basic and advance HACCP training for processing plant professionals.
- Continues to provide leadership to the Poultry Processors workshop sponsored by the Poultry Federation.



DR. SUSAN WATKINS
Water Quality

- Served as the Chair of the 2006 National Poultry Waste Management Symposium held in Springdale.
- Served as Chair of the National Egg Quality School held in Memphis, TN.
- Has given over 30 invited presentations on poultry house sanitation and the impact of water quality on poultry performance.
- Conducted research evaluating drinker systems, water sanitation products, litter amendments and feed additives.
- Coordinated and supervised renovations at the Applied Broiler Research Farm at Savoy.
- Continues to serve on The Poultry Federation Planning Committee for the Annual Poultry Symposium and as secretary for the Turkey Committee.



MR. JERRY WOOLEY
Youth Programs

- Sustained involvement in 4-H and FFA Poultry Judging Contest, 4-H Broiler and Turkey BBQ Contest, 4-H Pullet Chain and Youth Broiler Shows.
- Numerous training sessions held to equip agents and parents to compete in youth contests.
- Arkansas 4-H'ers competed well at the National Contest, placing first in Egg Cookery, second in Chicken Barbecue, second in Poultry Judging and seventh in Turkey Barbecue.



John Marcy, Extension poultry specialist, hosts Culinary Science Short Course



Photo by Karen Eskew

WE'RE ALWAYS COOKING IN POULTRY SCIENCE -- A student (left) from Tyson Foods, Inc., works on perfecting his sauce mixture as his instructor, Chef Suzie Stephens, watches during a week-long culinary class held at the Center of Excellence for Poultry Science test kitchen.



Photo by Karen Eskew

AND SOMETIMES, WE'RE ON FIRE -- Above, Dr. John Marcy, Extension poultry faculty member (not pictured) shows the culinary class how to flambé a steak with sauce mixture. This training is part of a five-day program to help industry personnel, in the area of research and development, enhance their product development skills by understanding the methods and language used in the culinary arts.

FAYETTEVILLE, ARK. ~ The poultry science department at the University of Arkansas is conducting a series of five-day basic culinary arts classes for professional food scientists.

The Culinary Experience for Product Developers short course will satisfy 40 hours of the 120 hours of hands-on culinary training required to become a Certified Culinary Scientist (CCS). The course was organized by Dr. John Marcy, a food scientist and Extension specialist in the poultry science department, and is sponsored by the Cooperative Extension Service, U of A Division of Agriculture.

Only 10 persons nationwide have met the CCS requirements set forth by the Research Chefs Association (RCA), Marcy said.

"For a land-grant university to be doing this is a pretty good thing," said Marcy. The only other places offering CCS classes are culinary schools in California, New York, Rhode Island and Chicago. Some 60 Tyson Foods employees involved in product development are expected to enroll in the classes here.

Marcy said most basic cooking methods will be taught during the five-day class by chefs Suzie Stephens and Morgan Stout. The five mother sauces are emphasized in this class: hollandaise sauce, espagnole (brown) sauce, velouté, tomato sauce, and béchamel. Many other sauces can be derived from these five mother sauces.

The class will include meat cooking methods of stewing, braising, roasting, grilling, sautéing, pan-frying and baking, Marcy said, plus garnish and plate presentation.

"All cooking methods relate to the quality of the dining experience," said Marcy.

The food industry is moving to a more culinary driven field, said Marcy. Processors employ culinary artists to design products. It is important that product developers have a culinary arts background as well as a food science background, he said.

A CCS is an experienced food scientist who has learned culinary arts in order to enhance product development skills, according to the RCA.

CCS certification requires a bachelor's degree in food science or a related area, three years in research and development and other requirements. Information about CCS and the RCA is available online at www.culinology.com/.

UA Poultry Extension Faculty Member organizes 4-H Barbecue Contest

4-H BARBECUE CONTEST -- Extension specialist Jerry Wooley, left, and Danny Williams of WYNCO, co-chairs for the 4-H barbecue contest held during the Poultry Festival in Little Rock, are shown with one of the younger contestants in the event during the Saturday morning cook-off. All contestants who participated are shown in the photo below. Wooley organizes youth barbecuing contests throughout Arkansas.



Photo by Karen Eskew



Photo by Karen Eskew

Jerry Wooley receives 30-Year Service Award



Photo by Karen Eskew

THIRTY YEARS OF SERVICE -- Dr. Robert Wideman, Jr., (left) is shown presenting a 30-year service award to poultry Extension specialist Jerry Wooley.

WHO ME? - Jerry Wooley, below, is surprised by a presentation for his 30 years of service during the Poultry Science Youth Conference. Wooley was unable to attend his special luncheon in Little Rock because he was hard at work at the youth conference in Fayetteville. Wooley has been instrumental in Arkansas poultry youth programs.



Photo by Karen Eskew

Frank Jones helps coordinate National Egg Products School on U of A Campus



Photo by Frank Jones

MIXING AND LEARNING -- Participants from the 2006 National Egg Products School conduct a hands-on experimental project at the Center of Excellence for Poultry Science. Visitors from around the nation gathered on the U of A campus for the week-long workshop, which is held annually.

FAYETTEVILLE, Ark. ~ The University of Arkansas was the site of the 2006 National Egg Products School (NEPS).

This nationally recognized school provides participants with an introduction to production, processing, functions in food and quality characteristics of liquid egg products.

The NEPS includes lectures, group discussion, hands-on laboratory exercises and a field trip to a breaking plant. The laboratory exercises focus on the functions of eggs in foods and included the production of foods - many of which were consumed by the class members.

NEPS participants must take a competency test at the end of course and those who pass the test receive a certificate of completion.

The director of the 2006 NEPS was Dr. Pat Curtis of Auburn University. The nine instructors for the school were all regarded as the top egg products researchers in the U.S. Dr. Frank Jones served as coordinator for the event. Thirteen participants attended this year's school, coming from six different states.

Originally the NEPS was held in various locations at hotels. It was moved to college campuses in order to use laboratory facilities to enhance the hands-on exercises. This year NEPS officials commented that they chose the UofA for its tremendous facilities, in fact, several commented that the Center of Excellence for Poultry Science's facilities were probably the best in the country.

Susan Watkins and Tyson Foods host “Meat Your Future” career event at poultry building on campus



Photo by Karen Eskew

MEAT YOUR FUTURE
-- From left, Jade Briggs, College Recruiter; Rashad Delph, Collegiate Recruiter; Jason Bradshaw, Live Receiving Supervisor; Suzanne Finstad, Manager of Food Safety and Regulatory Compliance; Sharon Beals, Director of Food Safety and Regulatory Compliance; and Carrie Burnett, College Recruiting Coordinator, all of Tyson Foods Inc., come together prior to hosting the “Meat Your Future” employment event on Thursday, Nov. 10th, 2005, at the Center of Excellence for Poultry Science. Students from all departments were invited to attend presenta-

tions, present their resumes and learn how to apply on-line for careers at Tyson during the two-hour event. Elanco donated door prizes and Tyson hosted a meal after the conclusion of the presentations. Coordinators for the event from the Department of Poultry Science included Dr. Susan Watkins, internship coordinator, and Ashley Swaffar, a junior poultry science major from Farmington.

Poultry Science Youth Conference: Combining Extension and recruitment efforts to host a successful event



Photo by Karen Eskew

CREATIVE COOKING -- Students participating in the Poultry Science Youth Conference show off colored chicken meat they produced in order to make “rainbow nuggets,” a new product they developed during the four-day, hands-on event. They later formed the meat mixture into nuggets shapes and fried them.

FAYETTEVILLE, Ark. -- A record 37 high school students from around the state experienced college life first-hand at the University of Arkansas while attending the 10th annual Poultry Science Youth Conference sponsored by the Center of Excellence for Poultry Science at the University of Arkansas.

The conference is designed to foster interest in the poultry industry, the University of Arkansas and the UA poultry science department through hands-on experiences, tours and industry presentations.

The theme of this year’s conference was “CSI: Chicken Scene Investigation.” Students were divided into six groups and each group came up with a unique product made out of chicken or turkey. The students determined their target market and were shown how to take their product from raw poultry to ready-to-serve products at the UofA’s pilot processing plant.

Gary Davis, undergraduate recruiter said, “We wanted students to get a feel for how enormous the poultry industry is. If they are interested in working in production, product development, sales, business, whatever they like, the poultry industry has positions available. Majoring in poultry science can open up tremendous opportunities for students.”

Student groups gave their group presentations before faculty members and parents during a closing ceremony in the Leland Tollett Auditorium in the Poultry Science Building.

Keith Bramwell continues to direct research at the UA Broiler Breeder Farm

Dr. Keith Bramwell, Poultry Extension Specialist, continues to be busy with projects at the University of Arkansas Broiler Breeder Research Farm. He serves as faculty director of the facility and coordinates with industry personnel regarding ongoing trials.

The facilities include an office/quality assurance building, an on-farm egg storage room and two solid-side-wall breeder houses (40' x 400') and a similarly built pullet house (40' x 350'). Additionally, this QA building is equipped with shower-in facilities to maintain a strict biosecurity program.

The pullet house has 16 pens for pullets and one pen for males that can also be subdivided. The breeder house is subdivided into 48 pens to ensure replication of treatments, with spare pens available for several smaller pilot research trials.

“Because our facilities are modeled after commercial-type housing with all the modern ventilation found in the industry, our operation is ideal for comparing production management programs that can then be easily adapted to industry situations,” said Bramwell.

Completed trials have compared pullet management programs including every-day vs. skip-a-day feeding and other feed restriction programs designed to control body weight gain. In the hen houses these birds are raised under various feed management programs to understand better the nutritional needs of the modern broiler breeder hen. Variations in feeding programs include rapid or slow feed withdrawal, and varying feed formulations. Each of these trials runs the normal length of production for a breeder hen, which is usually to 65 weeks of age. Other trials completed evaluated broiler breeder hen molting programs to provide industry with guidelines to follow when the need arises to molt hens.

Other projects conducted at this facility include evaluating the physiological changes that occur to pullets during the rearing phase of their production cycle. Physical markers such as fleshing, fat pad deposition, pelvis opening, feather molt, and keel and shank length are measured at predetermined intervals. These data can be used to predict the effectiveness of feed management programs and to determine which of these physical markers can accurately predict future production parameters. Additionally, several projects are underway evaluating hatching egg storage conditions and the effects of egg quality on hatchability.

Research conducted at the facility this past year has been presented by Bramwell throughout the State of Arkansas, as well as in many other poultry producing states in the U.S., as well as presentations made in Canada, Brazil and Central America.



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.

Representatives of Cobb-Vantress, Inc., have also presented research conducted at this facility throughout other parts of the world.

“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.

Dustan Clark continues the fight for biosecurity measures and poultry disease recognition

Poultry is a major agricultural product in Arkansas, farm sales alone are valued at close to 3 billion dollars. Mortality figures associated with broilers, turkeys, and layers are 4%, 8%, and 16% respectively, over the life of the flock. Infectious diseases are a major cause of the mortality and are also responsible for an additional 1+% loss in condemnations. Exotic disease outbreaks in Arkansas or in the United States could result in a quarantine of poultry and poultry products severely impacting the economy of the state. The recent concern with “bird flu” as a potential pandemic has reinforced the need for educational efforts directed toward Biosecurity to assist in preventing disease outbreaks and/or spread.

The value of the United States animal agriculture production is approximately 14% of the gross domestic product and represents approximately 18% of all employment with almost 1 million jobs. Exports represent roughly 20% of all animal production and over 140 billion dollars. The threat of agroterrorism is such that vigilance is needed to prevent the use of infectious diseases as a weapon against the food supply. The results of such a terrorist attack could cause complete shutdown of the exportation of specific animal products in accordance with various regulations associated with treaties and agreements to which the U.S. is a signatory.

Dr. Dustan Clark, University of Arkansas poultry veterinarian helps the poultry industry and producers and various private, backyard, and hobby flock owners recognize disease so appropriate control and/or treatment protocols can be initiated in a timely manner.

He also serves as a member of the Arkansas Animal Emergency Disease Response team, Poultry Health Advisory committee, and the Extension Biosecurity Committee. These teams and committees are responsible for educating producers and individuals about disease prevention and biosecurity; assisting in preparing guidelines for the industry as related to disease outbreaks; and conducting seminars, Amock outbreak drills™, and training sessions on disease outbreaks. Major concerns in 2005 were the 2003-4 outbreaks of Exotic Newcastle Disease (END) in California and British Columbia, Canada and outbreaks of H5N1 Avian Influenza (AI) in Asia and Europe and the concern that this “bird flu” could become pandemic.

Dialogue with numerous backyard, hobby, and exhibition flock owners in Arkansas has assisted greatly with biosecurity efforts in small flocks and an increased awareness of disease and preventative measures that will enhance the efforts of the Arkansas poultry industry.

The improvement in disease recognition by the poultry producer allows faster implementation of control procedures. In addition, the continued improvement of biosecurity protocols allows for better disease protection of a flock by reducing the exposure risk. Prevention and/or reduction in the incidence of disease can result in savings of millions of dollars. This vigilance and implementation of biosecurity protocols further enhances the efforts to prevent diseases such as “bird flu,” which are of great concern because of the potential adverse human health problems associated with the disease.

The education of backyard flock owners will greatly assist in the prevention of accidental introduction and transmission of various poultry diseases.

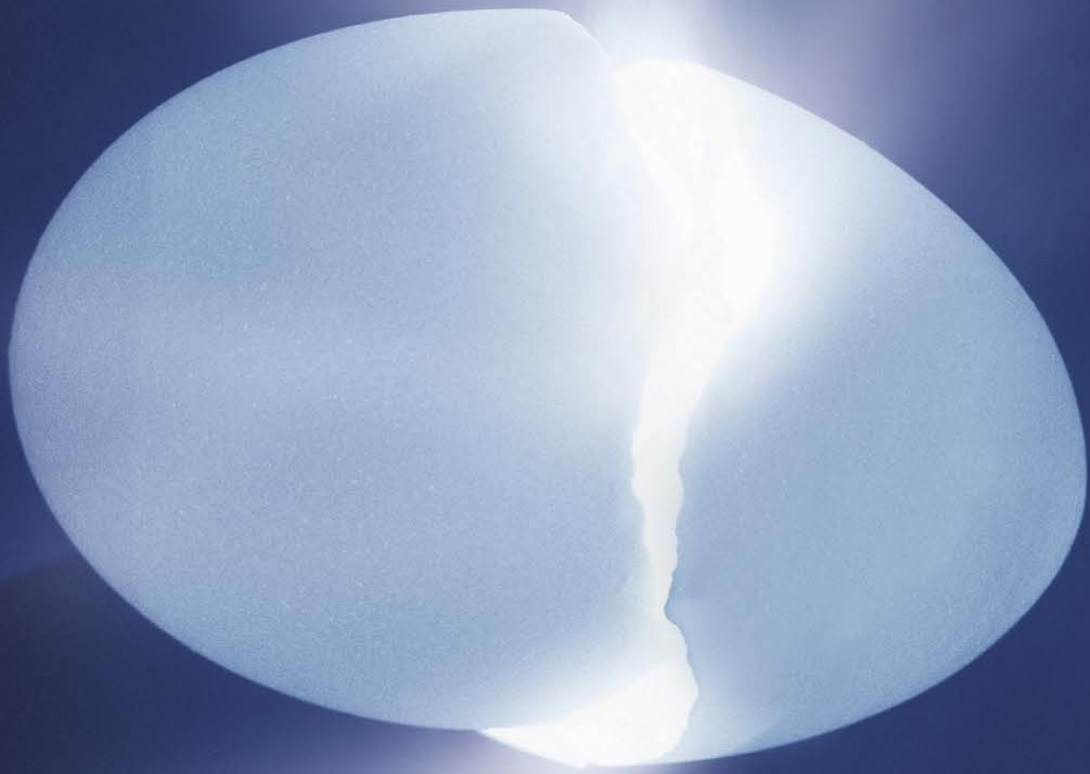


CHECKING THINGS OVER - Dr. Dustan Clark, Extension poultry veterinarian with the University of Arkansas Cooperative Extension Service, draws blood from a broiler during a routine check at the Arkansas State Fair. Clark spends countless hours training Arkansans about biosecurity and the proper methods to prevent disease in their backyard flocks.

Photo by Karen Eskew

noteworthy highlights

*other important news from the
2005-2006 fiscal year*



Center of Excellence for Poultry Science celebrates 10 Years in new building



Photo by Howell Medders

BIRDS EYE VIEW -

(Above) Looking down on the poultry center's celebration of 10 years in their current location.

(Right) The keynote address for the event was given by The Honorable David Pryor.



Photo by Howell Medders

FAYETTEVILLE, ARK. - On Thursday, Oct. 27, 2005, over 250 people gathered at the poultry center on campus to attend a celebration program, marking a decade since the John W. Tyson Building, the flagship facility of the Center of Excellence for Poultry Science, was completed.

Speakers at the event included Dr. Walter Bottje, Center Director and Department head; Dr. James Denton, former Director of the Center; Dr. Ivory Lyles, Associate Vice President for Agriculture - Extension; Dr. Gregory Weidemann, Dean of Bumpers College and Associate Vice President for Agriculture - Research; Dr. Milo Shult, Vice President for Agriculture and The Honorable David Pryor, Dean of the University of Arkansas Clinton School of Public Service and former U.S. Senator.

Immediately following the program, a barbecue chicken dinner was served to all program attendees.

"Senator Pryor and Senator Dale Bumpers were instrumental in helping ensure that the Center of Excellence for Poultry Science became a reality," said Denton. "It was only fitting that we had one of them give the keynote address at this celebration."

Denton was the chair of the Center Celebration Committee, which organized and hosted the event. Other members of the committee were: Diana Bisbee, Walter Bottje, David Chapman, Donna Delozier, Karen Eskew and Park Waldroup.

"We invited all the companies and individuals who originally donated money to construct and equip this building. We just wanted to thank them for their generosity," said Denton.

Others attending the event included current and past faculty, staff and students of the poultry center, university and college administrators, state legislators, industry personnel and friends of the program.

We're Celebrating
10 years as the
Center of Excellence for Poultry Science
1995-2005

Allied Industries makes \$18,000 donation to department

FOR A GOOD CAUSE -- Bob Ickes (left) signs the bid he won while Bob Rochelle looks on during the scholarship auction held at the Poultry Festival. This year the Allied Industries made a donation of over \$18,000 for student scholarships to the UA Department of Poultry Science. Thank you to the Allied Industry for your tremendous support of our programs!

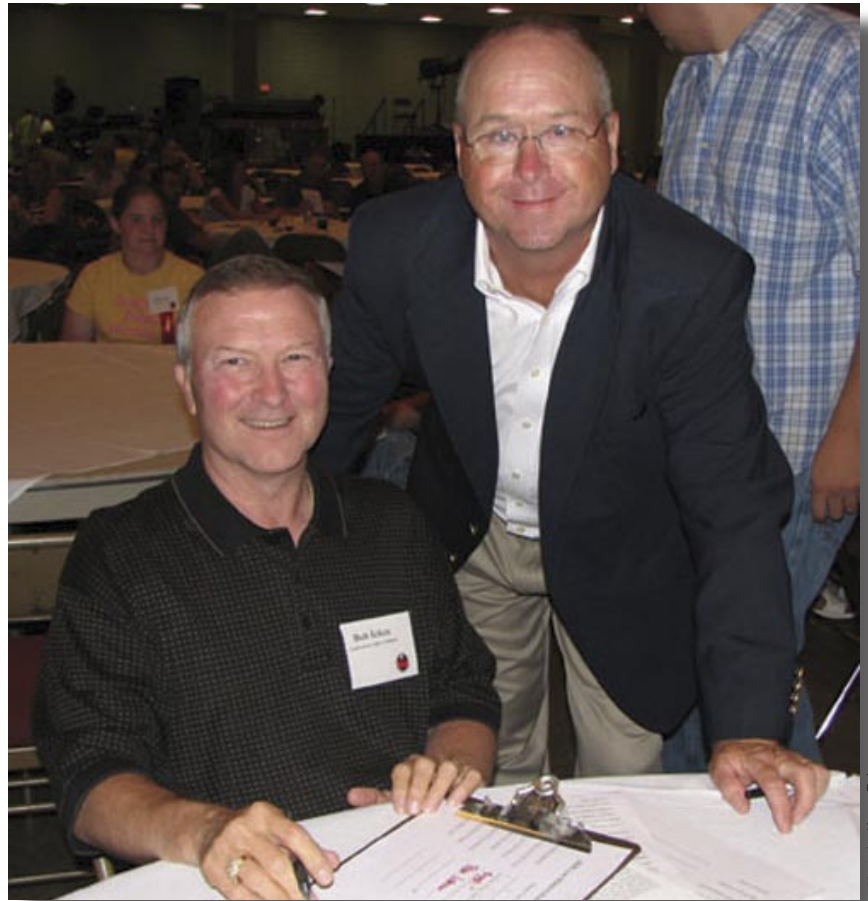


Photo by Karen Eskew

Debra Brooks named U of A Employee of the Quarter



Photo by Karen Eskew

UA AWARD WINNER -- Dr. Walter Bottje, department head of poultry science smiles as Debra Brooks, his administrative assistant, shows off her award from the University of Arkansas. Brooks received the "Employee of the Quarter" Award from the U of A for the 2nd quarter 2005-06. It was presented to Brooks at an awards presentation in February.

USDA and Center of Excellence for Poultry Science receive Technology Transfer Award

FAYETTEVILLE, Ark. ~ Laboratories from the USDA-ARS Poultry Production and Product Safety Research Unit and the Center of Excellence for Poultry Science received the Excellence in Technology Transfer Award from the Federal Laboratory Consortium for Technology Transfer Mid-Continent region.

The laboratories involved in the award-winning probiotic research were those run by Drs. Annie Donoghue, Dan Donoghue and Billy Hargis.

contact information **contact**

PUBLICATIONS

Book Chapters	6
Refereed Publications and Proceedings	57
Non-refereed Publications and Proceedings	100
Invited Lectures	25
Creative Endeavors	3

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THE JOHN W. TYSON BUILDING -
The Center of Excellence for Poultry
Science building on the University of
Arkansas campus in Fayetteville.




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