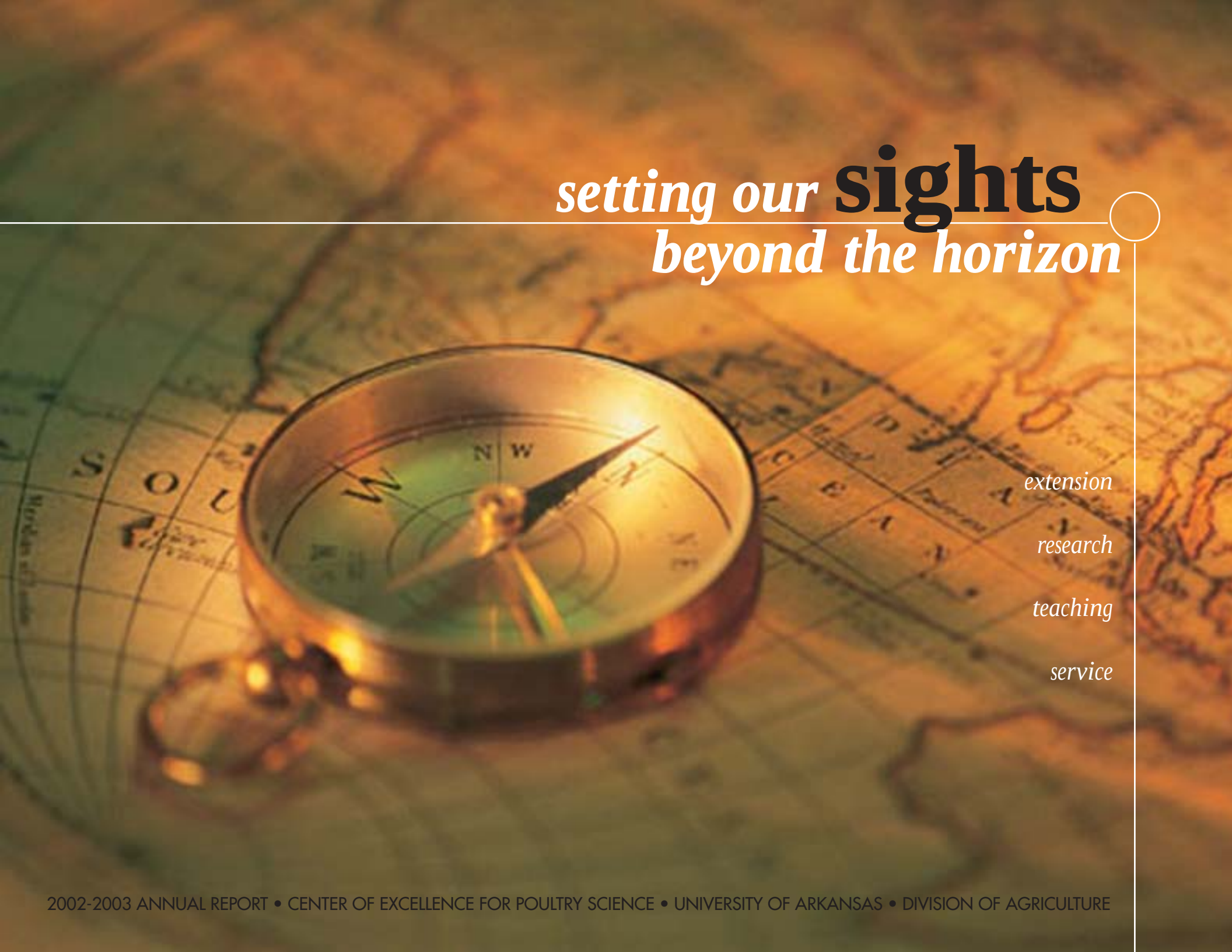

setting our **sights** *beyond the horizon*

extension

research

teaching

service

2002-2003 ANNUAL REPORT • CENTER OF EXCELLENCE FOR POULTRY SCIENCE • UNIVERSITY OF ARKANSAS • DIVISION OF AGRICULTURE

THE CENTER OF EXCELLENCE FOR POULTRY SCIENCE, 1260 W. MAPLE, FAYETTEVILLE, AR 72701 • 479-575-4952 • www.uark.edu/depts/posc

THE BEAUTY OF THE OZARKS - Beautiful fall afternoon in the Ozarks. This picture of sisters Niki and Andrea Loupe was taken on the front lawn of the Center of Excellence for Poultry Science.

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THE DIRECTOR IS IN - Center of Excellence for Poultry Science Director Walter Bottje is shown in his office on campus. Bottje was named Center Director this past June. Previously, Dr. Bottje served as Associate Director and Interim Director, respectively.

setting our sights *beyond the horizon*

The cover of this year's annual report, "Setting our sights beyond the horizon," again reflects the dedication and capabilities of all of the faculty, staff and students, as well as, our world class facilities that have helped position the Center of Excellence for Poultry Science as the leading poultry science program in research, teaching and extension. The end of this year marks the 10th year anniversary of the establishment of the Center. During that 10-year period, the Center has grown tremendously in facilities, faculty and students. During the coming year, we will begin to strategically plan ways that we can continue to grow and develop, and continue to lead. In doing so, we will need to continue to reach and set our sights beyond the horizon.

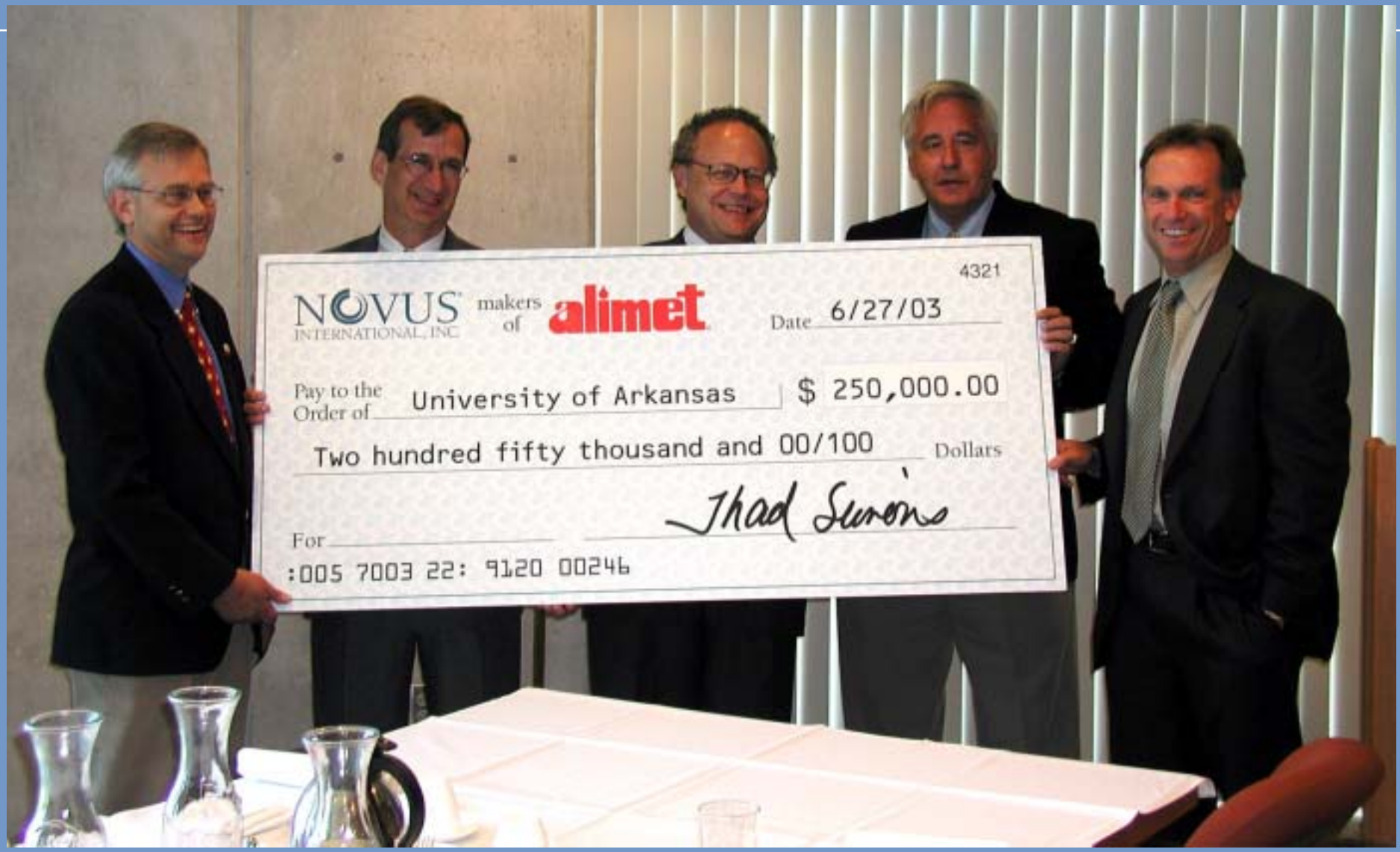
National recognition of the program continues in the form of national awards for faculty and students. Drs. Mark Parcells and Jason Emmert received the Hy-Line Research Award and the Purina Mills Teaching Award from the Poultry Science Association. A total of six students won outstanding presentation awards at national meetings during the past year. These students are now eligible to compete for manuscript awards from the society. An endowed professorship, made available by funds provided by the Walton Charitable Gift Foundation to the University of Arkansas was awarded to Dr. Park Waldroup through matching funds provided by Novus International, Inc. (St. Louis, MO). Novus has been a long time supporter of the Center and now has provided a lifetime of support by establishing the Novus International Professorship in Nutrition and Metabolism. This endowed professorship was the first to be announced in the Dale Bumpers College of Agricultural, Food, and Life Sciences, and only the second one announced on campus. Stacy Higgins was named the first Distinguished Doctoral Fellowship recipient in the department. The Distinguished Doctoral Fellowships are provided through the Walton Charitable Gift Foundation to help attract the best and brightest students into Ph.D. programs throughout the campus. Ross Wolfenden (undergraduate student) was one of the first to graduate from the Bumpers College honors program.

Industry support remains an important cornerstone in our quest to remain excellent and continue to excel in our programs. A Broiler Breeder Research Farm project has been initiated and is scheduled to be completed with the first flock housed in February of 2004. This world class facility built with funds provided by Cobb-Vantress, Inc., and Tyson Foods, will allow us to focus considerable research effort on management and nutrition of broiler breeders. This will enable us to provide answers to the industry in broiler breeder management for important issues now and well into the future.

Our faculty continues to be competitive in obtaining outside grant support for the research program. During the past year, over $1.2 million was obtained in federal and industry grants.

We will be entering the next decade with an eye to the future that will have many opportunities and challenges. We will be making subtle changes to remain relevant in our programs, but always keeping in mind that we want to, and will, remain the leader in our field. But for now, please take a few minutes to see what we have done during the past year that has helped us keep our sights beyond the horizon.

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



GENEROUS DONATION FOR DISTINGUISHED PROFESSORSHIP -From left, Chris Knight, research and development head for Novus International; Gregory Weidemann, Dean of the Bumpers College of Agricultural, Food & Life Sciences; Thad Simons, Chief Operating Officer of Novus; Park Waldroup, Distinguished Professor; and Walter Bottje, Center of Excellence for Poultry Science Director hold up a "check" representing Novus International's endowment gift of $250,000 toward Waldroup's professorship and continued research and teaching in the area of poultry feed proficiency.

Novus International Endows Waldroup's Professorship

FAYETTEVILLE, Ark. --- Novus International, Inc., President and COO Thad Simons presented a check for $250,000 on June 27 to University of Arkansas officials to complete an endowment for the new Novus International Professorship in Poultry Science.

The Novus gift will be matched by $250,000 from the Walton Family Charitable Support Foundation's $300 million gift to the University in 2002. Investment returns on the total endowment of $500,000 will be used to enhance teaching, research and service programs, said Dean Gregory Weidemann of the Dale Bumpers College of Agricultural, Food and Life Sciences.

Weidemann announced that University Professor Park Waldroup will be the first holder of the professorship. "Dr. Waldroup is an outstanding teacher and researcher, and he is internationally known as a leading authority on poultry nutrition," the dean said.

"This prestigious professorship is a well-deserved honor for Dr. Waldroup, and it significantly raises the stature of our Center of Excellence for Poultry Science to have such a ringing endorsement from Novus International and the Walton Family Charitable Support Foundation," Weidemann said. Novus International, based in St. Louis, is a leading supplier of animal nutrition and health products.

"Novus is well known as an innovative, science-based company that supports university research," Weidemann said. "They share our commitment to meeting the needs of animal producers, and ultimately consumers, through research to develop products and systems that are economically and environmentally sound."

Simons said, "The future of the poultry industry rests in the hands of institutions such as the University of Arkansas and mentors such as Dr. Waldroup. Novus is proud to help pave the way for the next generation of agriculture innovators who must continue to improve meat production proficiency to feed the growing global population."

Novus International's Head of Research and Development, Chris Knight, said, "Dr. Waldroup is at the pinnacle of his discipline as an internationally recognized poultry scientist. I am happy that Novus will continue to be associated with his work and the entire poultry science program at the University of Arkansas."

The endowment will increase research opportunities for graduate students and for undergraduates in the new Honors College, Weidemann said, in addition to strengthening research and extension programs in nutrition, metabolism and other growth and health issues.

Waldroup has been chairman of the Animal Nutrition Research Council, which develops standards for animal and human nutrition research. He has been a member since 1981 of the Poultry Nutrition Subcommittee of the National Research Council, which sets nutrition standards followed by the poultry industry worldwide. He is a fellow of the Poultry Science Association and has received many awards, including the first National Broiler Council Research Award.

Waldroup has been widely published in scientific research journals and has guided over 50 students to M.S. and Ph.D. degrees. He has presented seminars in some 40 countries.

Waldroup's research helps determine nutrition requirements of broiler chickens and turkeys as influenced by factors such as breed, environment and production systems. He evaluates new and modified ingredients and provides data for computer models to emulate growth under various nutrition regimes. Recent research by Dr. Waldroup has also been important with respect to lowering dietary costs, a major expense in poultry production, and in reducing phosphorus excretion.

Waldroup says he feels he has come full circle, since Monsanto is the predecessor of the company of Novus International Inc., the company that is financing half of his endowed professorship.

"It reminds me of the 'Circle of Life' concept depicted in the Walt Disney® movie The Lion King," Waldroup said. "It's ironic that the company responsible for my first experiment is now the same company sponsoring a professorship in the autumn of my career."

Novus International, Inc., is headquartered in St. Louis, Missouri, and serves customers in more than 80 countries around the world.

UA scientists are looking into the possibility of rapid, sensitive and specific methods to detect pathogens in food products on line by using biosensors. Another project UA scientists are looking into is the use of a chemical "spray" on chicken carcasses inside birdwashers at processing plants to reduce the possibility of diseases such as S. typhimurium and C. jejuni.

Biosensors for Rapid Detection of Pathogenic Bacteria in Food Products

Issue

Conventional microbial detection methods are time consuming and expensive. It cannot match rapid food processing and distribution systems. To minimize product recalls, clear international trade barriers due to microbial contamination and ensure food safety, the food industry needs rapid, sensitive and specific methods to detect pathogens in food products on line or even in real time.

Action

UA scientists developed an immuno-electrochemical biosensor system coupled with immuno-magnetic separation for detection of *S. typhimurium* in chicken carcass wash water. The method can enumerate *Salmonella* in two hours with a detection limit of 1x102 cell/ml. A bienzyme electrode was developed for the biosensor system to improve sensitivity (*E. coli O157:H7*, 200 CFU/ml). A chemiluminescent optic fiber biosensor (see p. 10 for photo) was developed in conjunction with immuno-magnetic separation for rapid detection of *E. coli O157:H7* in food samples. The detection range is from 102 to 106 cfu/ml and the detection time is one and a half hours.

An immuno-optical biosensor and chemiluminescent membrane fiber optic biosensor are also being studied for detection of *S. typhimurium*, *L. monocytogenes*, *E. coli O157:H7* and *C. jejuni* in raw and cooked poultry and meat products. The primary results showed the detection limit and detection time were 100-1000 cells/ml and less than two hours. A PCR-based biosensor was investigated and the result indicated that as low as two cells/ml of *S. typhimurium* or *C. jejuni* in poultry carcass wash water could be detected in three hours. A capillary bioseparator/bioreactor was also developed to enhance the binding efficacy of antibodies/antigens and the enzymatic reaction, and to design an automated instrument. This provided a cost-effective alternative for better sensing target bacteria in the applications of electrochemical or optical biosensors.

Impact

The results of this research could provide food processors with new technology to detect pathogens in foods in less than two hours with acceptable detection limits (<100 cells/ml). The food industry could save millions of dollars annually by avoiding product recalls. Consumers could benefit from reduced foodborne diseases and associated medical costs.

Antimicrobial Spray of Prechill Chicken Carcasses during Poultry Processing

Issue

Bacterial contamination of chicken carcasses may occur during processing. Poultry processors need to improve processing procedures and select new equipment for reducing or eliminating pathogens during processing. Their existing inside/outside birdwashers may be modified to spray chemical solutions at different conditions onto chicken carcasses for cleaning both physical and microbial contaminants. Basic data for antimicrobial spray need to be collected and optimal spray conditions need to be determined.

Action

Inside/outside chemical spray, including cetylpyridinium chloride (CPC), trisodium phosphate (TSP), lactic acid, chlorine, electrolyzed water, has been tested using a commercial scale I/O birdwasher in a pilot plant. The result showed that 0.5% CPC and 10% TSP spray effectively reduced *S. typhimurium* and total aerobic plate counts on chicken carcasses. The optimal spray conditions, such as temperature, pressure and exposure time, have been determined. High temperature water spray is being tested for reduction of *C. jejuni* on chicken carcasses using the I/O birdwasher.

Impact

The results of this project could help poultry processors select more effective alternative antimicrobial treatment method in poultry spray during processing so that the industry can modify their exiting spray process to effectively control *S. typhimurium* and *C. jejuni* on chicken carcasses. This will enhance the poultry processors' HACCP programs to ensure food safety and quality. This research will also provide the food equipment industry with required data to improve poultry spray equipment for better function in reducing microbial contamination.

Campylobacter Isolates Vary in Toxicity

Issue

Campylobacter jejuni is one of the leading causes of diarrheal associated foodborne illnesses in the world and has been implicated in the initiation of Guillaine-Barre´ syndrome. It is of critical importance to the protection of public health to determine whether all wildtype *Campylobacter jejuni* bacteria are a high potential risk for foodborne disease.

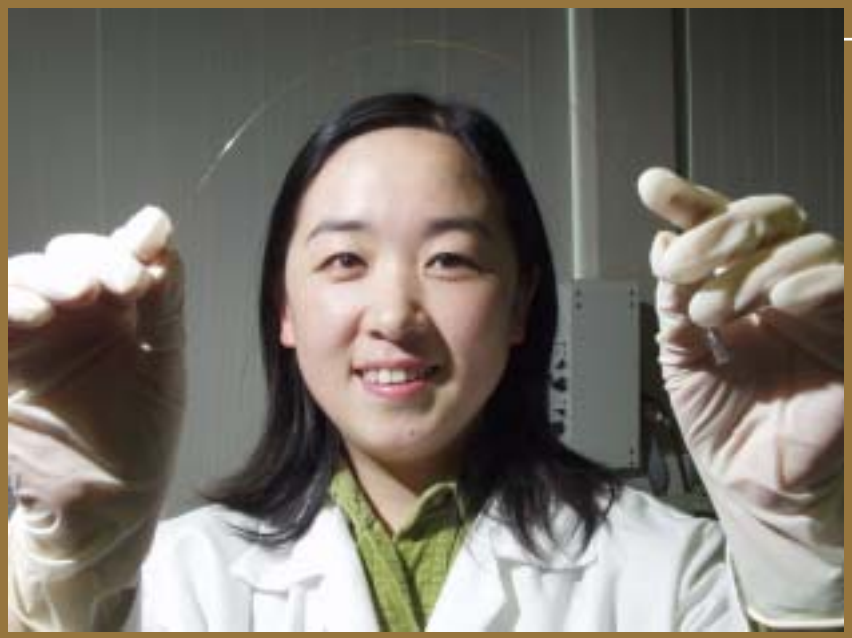
Action

Using pulsed-field gel electrophoresis, Arkansas scientists constructed a DNA database of *Campylobacter jejuni* strains isolated from pre-chill chicken carcasses, post-chill chicken carcasses, whole chicken carcasses purchased at retail, and humans. Analysis of these data revealed that genetically identical *Campylobacter jejuni* can be isolated from different chicken carcasses. We constructed plasmid profiles of the human isolates and analyzed restriction patterns of the purified plasmids. We have completed a cytotoxicity study of these isolates and found that a wide range of toxicity exists among *Campylobacter jejuni* isolates.

These data also suggest that since human isolates possess a higher overall level of cytotoxicity than the isolates obtained from chicken carcasses, cytotoxicity may be a primary pathogenicity factor in determining virulence of wildtype *Campylobacter jejuni*. We are completing a study of the ability of these isolates to attach to, and penetrate into, human intestinal cells.

Impact

Many outbreaks of foodborne pathogens result from exposure to a common source. By providing accurate information concerning specific DNA evidence on the source of the foodborne bacteria, the food companies will benefit economically by being able to pinpoint areas and situations in their food processing that are sources of potential foodborne bacteria. Thus, the companies will have a higher probability of correcting these problems and providing a safer product for the consumer.



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

BACTERIOPHAGE RESEARCH - Agricultural Research Service (ARS) biological science technician Scott Zornes, right, lets poults out of a chamber after they inhaled an aerosol mist containing bacteriophages. The mist has proven to be an effective means of administering bacteriophage treatments to protect against respiratory infections.

The National Alliance for Food Safety and Security and its Vital Link with The Center of Excellence for Poultry Science

Issue

Continuous improvement in the safety of the food supply is vital to ensuring the public's health and to enhancing our national and international food supply. A partnership among universities and the federal government providing a proactive approach to food safety is the most effective strategy for implementing food safety research, education and outreach programs. The National Alliance for Food Safety and Security (NAFSS) was established to meet this challenge through strengthened coordination and collaboration among its members.

Action

Arkansas scientists provided leadership to organize and operate the NAFSS. The NAFSS was formed in November 1998; it includes 19 universities and three USDA agencies; the Agricultural Research Service (ARS), the Food Safety and Inspection Service (FSIS), and the Cooperative State, Research, Education and Extension Service (CSREES). Their mission is to continually improve the safety of our food supply to ensure the public's health and to enhance our national and international food supply. The NAFSS is organized in 12 Virtual Centers, six of which are commodity based and six of which are discipline based. The commodity-based centers are beef, dairy, plant, pork, poultry, and seafood/aquaculture. The discipline-based centers are detection and typing methods, education and outreach, food toxicology, microbial physiology and ecology, pathogen control, and risk analysis and policy. The NAFSS administers a research proposal process annually ($1M) for research initiatives in addressing timely issues. In addition, there are also education initiatives designed to address issues of concern.

Impact

Two of the more significant accomplishments of the NAFSS are outlined as follows:

1) The NAFSS conducted the third party review of the experimental design, data collection/analysis and conclusions of the HACCP-Based Inspection Models Project (HIMP), which was originally prepared by RTI, Inc., for the USDA-FSIS. This was accomplished by assembling a team of nationally and internationally recognized experts in poultry health, food microbiology, poultry processing and bio-statistics from the faculty membership of the NAFSS. Arkansas scientists played a prominent role in the review. Results of the review were presented during the November 2002, meeting of the National Advisory Committee for Meat and Poultry Inspection in Washington. The review recommendations will be used in guiding policy decisions of the FSIS regarding meat and poultry inspection systems.

2) The NAFSS was requested to cosponsor, with the Institute of Food Technologists, the 2003 International Food Safety and Quality Conference.

Viruses Instead of Antibiotics for Poultry Disease?

Issue

Early results with experiments using bacteriophages to reduce foodborne pathogens and treat various poultry diseases are encouraging. Bacteriophages—or phages for short—are viruses that infect and kill bacteria, and a particular phage can usually infect only one or a few related species of bacteria.

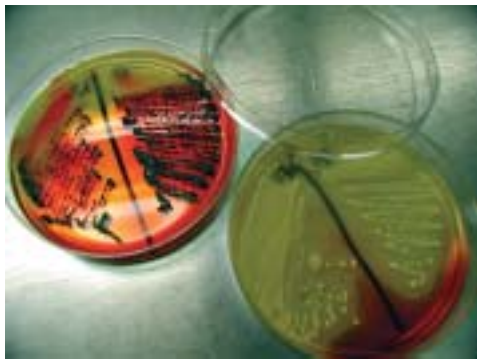
Agricultural Research Service (ARS) researchers isolated a number of phages, that would target a particular strain of *E. coli* that causes an air sac infection, called air saculitis, in broiler chickens. The disease leads to death or condemnation of the carcasses during processing, and is very difficult to treat.

Action

When the scientists mixed a bacteriophage with the *E. coli* strain—serotype 02—before they challenged broiler chickens with the bacteria, the animals were completely protected from respiratory infection. The researchers suspect other phage strains may be even better suited to prevent air saculitis. And they recently began to investigate the effectiveness of phages to treat the infection in poultry and perhaps become an alternative to antibiotic use.

Impact

The scientists are also investigating the efficacy of phages against other foodborne pathogens, such as *Salmonella* and *Campylobacter*. They have isolated phages effective against *Salmonella*. Phages were first discovered in 1915, but research on their therapeutic use was largely abandoned outside of Eastern Europe when antibiotic drugs became widely available in the 1940s.



STUDYING DISEASE - Above is a photo of a Salmonella culture growing in our Poultry Health Laboratory.

Technique Identifies Broilers with Strong Lungs

Issue

Broiler chickens are capable of growing so rapidly that their lungs cannot readily accept and oxygenate the large volume of blood that must be pumped by the heart to support tissue metabolism. This restrictive lung capacity can be responsible for causing substantial mortality in fast-growing broilers exposed to either cold or hot environmental temperatures. Broilers exposed to extreme temperatures are particularly susceptible to cardiopulmonary limitations because their heart must pump additional blood to support increased metabolic heat production during cold weather, or increased heat dissipation during hot weather. Techniques that permit broiler geneticists to efficiently select for improved cardiopulmonary performance will substantially improve the growth and livability of commercial broilers.

Action

A technique was developed for injecting micro-particles into the bloodstream as a method for selecting broiler lines that have a genetically improved cardiopulmonary capacity (U.S. patent pending No. 09-013,774). Briefly, suitably sized micro-particles are injected intravenously and carried by the blood to the lungs, where small blood vessels become obstructed in proportion to the numbers of injected particles. Broilers having a limited pulmonary vascular capacity can be readily identified and those with superior cardiopulmonary capacity subsequently exhibit significant improvements in growth and livability during exposure to either cold or warm temperatures.

Impact

Micro-particle injections provide broiler geneticists with an efficient technique for rapidly identifying individual birds that have an inadequate pulmonary vascular capacity. Superior broilers will possess a robust cardiopulmonary capacity that conveys parallel resistance (increased growth performance, reduced mortality) during exposure to either cold temperatures or heat stress. Broiler growers will benefit from improved livability accompanied by improved flock growth performance.

SHEAR PRECISION - A researcher is shown evaluating tenderness by using the razor blade method to shear through cooked broiler breast meat. This method has been superior in predicting poultry meat tenderness and has less sample preparation involved, making it more efficient than other methods of prediction.

Using a Novel Razor Blade Shearing Method to Measure Poultry Meat Tenderness

Issue

Toughness is the most common qualitative problem in producing boneless meat. Texture is an important attribute of poultry meat acceptance by consumers and as such, an important component of meat quality. Through experience, discussions with consumers, and a survey of retail broiler meat tenderness using instrumental methods, it is apparent that broiler meat in the consumer market may be considered tough. This problem may be associated with the increased pressure on plants to produce broiler meat while reducing production costs, resulting in shortened aging times.

Historically, sensory and instrumental techniques have been used in combination to ensure that food texture is in compliance with consumer expectations. Sensory evaluation techniques being costly and time consuming, considerable research effort has been devoted toward the development of instrumental methods that would effectively predict sensory texture characteristics of foods or its acceptance by consumers. Existing instrumental methods for the evaluation of poultry meat have focused on the evaluation of predefined parameters, such as shear force, and the use of these parameters to correlate with sensory evaluation data.

Action

Arkansas scientists documented that the new razor blade shear method of evaluating poultry meat provides a higher correlation to sensory attributes than the standard Allo-Kramer (AK) shear method. Broilers were processed and deboned at various time points in order to obtain a wide variation in tenderness. Fillets were cooked and sheared using the AK shear and razor blade shearing tests. Fillets were also subjected to descriptive analysis by a trained sensory panel. Additionally, muscle sarcomeres were measured on raw fillets. Correlations between shear methods and sarcomere length to descriptive analysis were calculated.

Impact

The razor blade shear method exhibited a higher correlation to sensory attributes than the AK method, which suggests that the new razor blade shear method is superior in predicting poultry meat tenderness. This new method not only has more predictive value, but also has less sample preparation involved as it is conducted on intact fillets.

Feed Management Key to Efficient Broiler Chick Production

Issue

A major limiting factor in the continuing development and growth of the poultry industry in Arkansas and the nation is the production of adequate hatching eggs and quality broiler chicks necessary to supply the industry. A key problem associated with the feeding and management of modern breeder strains is the lack of uniformity of breeder flocks. A large range of body weights, body compositions, and state of maturity of breeders make it difficult to maximize flock performance. Heavier weight breeder pullets become sexually mature and lay earlier than lighter weight breeders. The formation and production of hatching eggs for the sexually mature heavier weight breeders requires significantly more dietary energy and protein than nutrients needed for controlling body weight of non-sexually mature breeder pullets. Egg producers have previously assumed that the light weight breeder pullets in the flock produced less hatching egg numbers, had more problems with obesity, and were more vulnerable to increased mortality compared to earlier maturing breeders.

Action

The University of Arkansas conducted experiments to determine how different dietary and management systems may benefit hatching egg production for pullet flocks consisting of light, average, and heavy weight pullets prior to sexually maturity. The breeder pullets were individually housed in temperature controlled housing, photostimulated at 21 weeks and fed increasing daily amounts of feed based on the overall flock egg production. As previously thought, the heavier weight breeder pullets sexually matured earlier, reaching 50% production four to five days quicker than lighter weight pullets. The lighter weight pullets also gained significantly more weight compared to the heavier pullets prior to flock peak production and throughout the laying cycle. Surprisingly, overall performance (percent mortality, hatching egg production, feed conversion, and egg weight) from the lighter breeder pullets through a complete 40 week production period was equal or numerically better than earlier maturing standard body weight pullets.

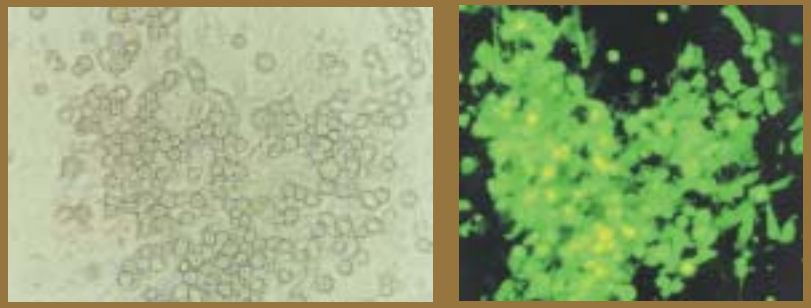
Another important finding of the research was that a more aggressive reduction in daily feed intake, after peak production, did not affect egg production or egg weight and numerically improved feed conversions for each of the body weight groups of breeder hens. The aggressive reduction in feed intake during the latter stages of production allowed the base line feed intake of 14% less than peak feed to be reached at 45 weeks of age compared to 50 weeks with a more standard withdrawal rate. The breeder hens that had feed reduced at the faster rate required 5 g less feed per hatching egg and approximately 7 g less feed per hatching chick.

All breeder pullets in the Arkansas research study, including all body weight groups, produced approximately eight additional hatching eggs per breeder and five additional hatched chicks per breeder compared to the Breeder Standard for the breeder hen.

Impact

A more aggressive feed withdrawal system after peak production would reduce up to 2.23 pounds feed needed for each breeder during a 40 week production period. The feed savings based on current feed prices would be approximately 16 cents per breeder. Optimum feeding conditions for breeder hens during the production period could provide five additional hatched chicks per breeder providing an additional $1.50 gross income 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 breeder flocks increase the supply of quality chicks for grow-out to support the worldwide increasing demand for poultry meat. Managers could be more selective in hatching eggs that are used for incubation and improve both chick quality and hatching percentage.

NATIONAL AWARD WINNER - Dr. Mark Parcells, shown above, in his lab where he conducts award-winning research. Parcells is a molecular virologist at the University of Arkansas and began his research on the Marek's Disease Virus (MDV) during his post-doctoral work at the University of Delaware in 1994. Parcells received the Hy-Line International Research Award from the Poultry Science Association.



GLOWING RESEARCH - Marek's disease is a herpesvirus-induced cancer of chickens that causes more than $1 billion in control costs to the U.S. poultry industry annually. Arkansas molecular biologist Mark Parcells took top honors at PSA for his continuing work with this disease. Above, a green fluorescent protein (GFP) gene aids Parcell's research on Marek's disease virus by serving as a marker gene allowing researchers to measure activity of the virus as indicated by the level of fluorescence.

UA Poultry Scientist Mark Parcells Receives Top Honors at Poultry Science Association's Annual Meeting

WILMINGTON, Delaware --- Poultry Science faculty member Mark Parcells took top honors in his field at the Poultry Science Association's (PSA) annual meeting in Wilmington, Delaware. This poultry scientist, in the Dale Bumpers College of Agriculture, Food and Life Science at the University of Arkansas, received national recognition and a cash award for his research.

Parcells, associate professor in molecular virology, was awarded the Hy-Line International Research Award and $1,500. This award recognizes a PSA member who, as a sole or senior author, published outstanding research in poultry science during the previous calendar year. Parcells' research focuses on molecular mechanisms of the Marek's Disease Virus (MDV), which is a contagious disease of domestic chickens.

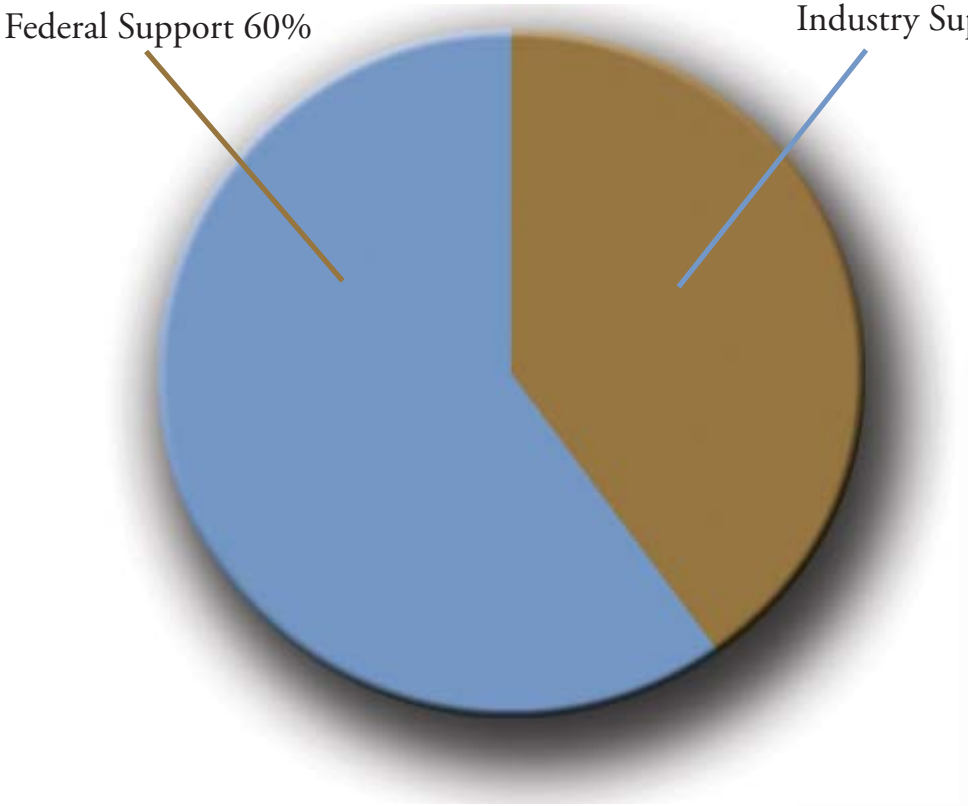
Parcells' paper, "Marek's Disease Virus (MDV) Encodes a Interleukin-8 Homolog (vIL-8): Characterization of the vIL-8 Protein and a vIL-8 Deletion Mutant MDV" was an interdisciplinary research effort with scientists from the University of California, Davis (UC-Davis); the Slovak Academy of Sciences in Bratislava, Slovak Republic; the Department of Pharmacology and Toxicology at Dartmouth Medical School in Hanover, New Hampshire; and the USDA-ARS Avian Disease and Oncology Laboratory in East Lansing, Michigan. Key collaborators on the project were Su-Fang Lin and Hsing-Jien Kung of UC-Davis.

"I'm grateful to Hy-Line International and the PSA awards committee for this great honor. In working in poultry science, I've found it to be a very collegial atmosphere. I have received great cooperation and outstanding support for my research. It truly has been a tremendous team effort," said Parcells.

WINNERS - Award-winning grad students pictured from left, Carol Ojano-Dirain, Stacy Higgins, Niki Loupe and Chris Sartor. Not pictured: Carl Gilbert.

UA Grad Students Take Top Honors

At the Southern Poultry Science Society's Annual Meeting January 5, 2003, in Atlanta, five UA poultry science graduate students received top honors during the Graduate Student Presentation Award Competition for their respective research projects. The students winning awards were; Carl Gilbert, Stacy Higgins, Niki Loupe, Carol Ojano-Dirain and Chris Sartor. Only 16 awards were given out in total and the UA grad students did a tremendous job by being awarded a large percentage of the honors. By winning these awards, students are now eligible to compete for the Alltech Outstanding Graduate Student Manuscript Award.



Breakdown of Support Dollars:

Federal Money .....$ 785,090.00
Industry Money .....$ 533,279.00

Total dollars for research
and sponsored support for
Fiscal Year 2002-2003: ....$ 1,318,369.00

TOTAL: $1,318,369.00

We thank the industry for their continued support of research at the Center of Excellence for Poultry Science. This year, a new opportunity presented itself with the generous contribution by industry partner Novus International and the establishment of the Novus International Professorship. Dr. Park Waldroup was named the first recipient in the department to receive this distinguished honor. If your company is interested in knowing more about endowing a professorship, please contact Chuck Culver (cculver@uark.edu) or Mark Power (mepower@uark.edu) and they will be happy to explain the details. It's an incredible way to make a lasting contribution in the field of research for poultry science. To read more about the Novus gift, please see page 6-7. (Endowed professorships and donations are not listed in above totals.)

OUTSTANDING TEACHING -Jason Emmert, associate professor in nutrition, explains to students during his breeder production class, how heat loss occurs in birds.

Emmert wins Outstanding Teaching Award from Purina Mills at Poultry Science Association's Annual Meeting

WILMINGTON, Delaware - Dr. Jason Emmert, associate professor in nutrition and undergraduate curriculum coordinator for the department, received the Purina Mills Teaching Award and $1,500 at the Poultry Science Association's Annual Meeting in Wilmington, Delaware. While Emmert conducts several research projects in nutrition at the U of A, his primary responsibility is teaching. Currently, Emmert is teaching a freshman-level poultry careers course, two poultry production courses, as well as poultry judging and selection. Emmert also serves as the teaching coordinator for the department.

Emmert's service activities are largely devoted to teaching and advising students and include chairing the departmental Advising and Curriculum Committees and coordinating the departmental scholarship program. He routinely advises 20 to 30 undergraduate students and currently has two graduate students.

As a proponent of providing undergraduate research and teaching opportunities, Emmert has directed 21 undergraduate students in teaching or research related projects. He also serves as Poultry Science Club advisor and assists with undergraduate recruitment primarily through dozens of FFA judging workshops in Arkansas.

Emmert's notable teaching accomplishments include the development of two internet-based poultry production courses for use in distance education, which was accomplished with the assistance of a USDA Higher Education Challenge Grant.

Emmert received the University of Arkansas Gamma Sigma Delta Teaching Award in 2001 and the Dale Bumpers College of Agricultural, Food and Life Sciences John W. White Teaching Award in 2002. He has also twice been selected to receive the U of A Poultry Science Club "Mentor of the Year" award (2001,2002).

"The future depends in part on students in teaching programs across the country. This teaching award is given to someone who has a great influence on the future of PSA, and we're proud that it's one of our own," said Dr. Walter Bottje.

"I attribute receiving this award, after a relatively short period at the U of A, to the wonderful teaching support available in our department and College," said Emmert. Emmert joined the UA poultry science department in 1997.

COMMENCEMENT SPEAKER - A Bumpers College graduate looks on as former Senator Dale Bumpers, the college namesake, autographs a copy of his book as a gift to her. Sen. Bumpers was the commencement speaker at this year's ceremony on May 10, 2003.

Undergraduate and Graduates Receiving Degrees at Commencement 2003

UNDERGRADUATES:

December 2002

Chad Burkett
Amanda Drake
Lindsay Hale
Robin Jarquin
Joseph Moore
Jason Nordin

May 2003

April Grossman
Daniel Hinton
Cody Keen
Timothy Kimball
Hugh Lumpkin
Timothy Peters
Leslie Rose
Ashley Stinnett
Ross Wolfenden

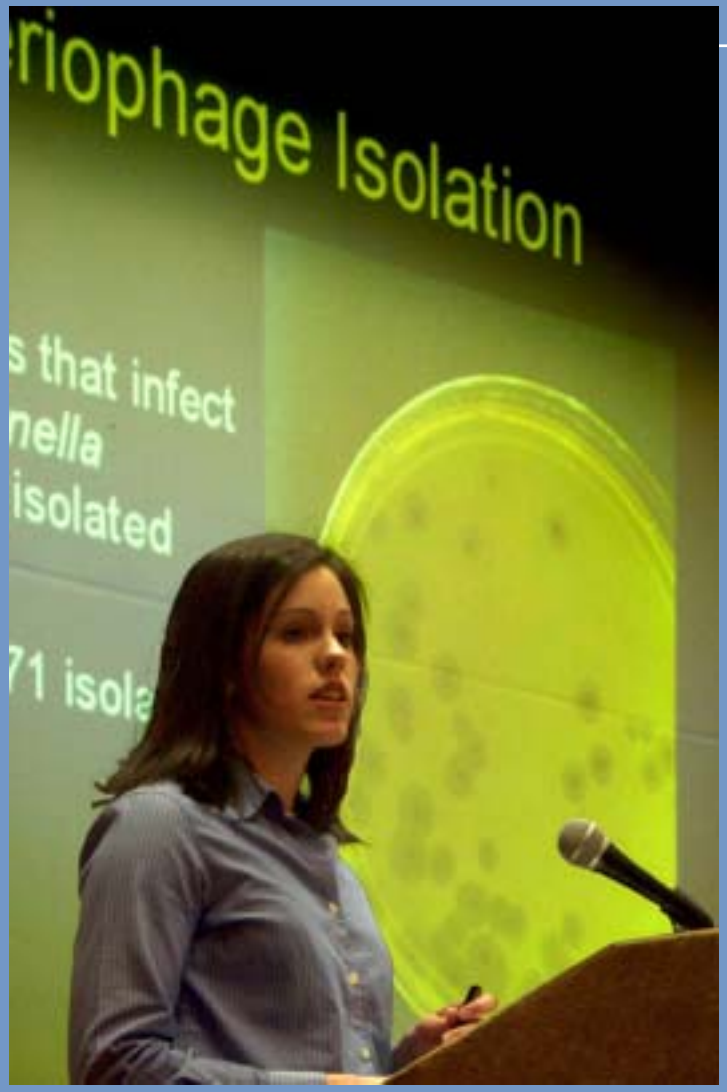
GRADUATES:

December 2002

Hari Bhaskaran (M.S.)
Wenjun Pan (Ph.D.)

May 2003

Mark Chapman (M.S.)
Mura Devabhaktuni (M.S.)
Hilary Pavlidis (M.S.)
Wenjun Wang (Ph.D)



TELLING LIKE IT IS - University of Arkansas graduate student Stacy Higgins describes her poultry science research during the Poultry Symposium in Springdale, an annual event of the Poultry Federation. Higgins is the first Distinguished Doctoral Fellow in the poultry science department of Dale Bumpers College of Agricultural, Food and Life Sciences. She is working with UA Poultry scientist Billy Hargis to reduce or eliminate bacterial contaminants in poultry by using specialized viruses, called bacteriophages, and harmless competitive bacteria.

Poultry Science Graduate Student named the First Distinguished Doctoral Fellow in the Department

SPRINGDALE --- A University of Arkansas graduate student is helping wage war on the microscopic level against bacterial contaminants in poultry. Specialized viruses, called bacteriophages, and harmless bacteria that compete with Salmonella and other illness-causing bacteria, are promising new tools for the food safety arsenal, Stacy Higgins of Lytle, Texas, told the crowd attending the annual Poultry Symposium in Springdale this month.

Higgins is the first Distinguished Doctoral Fellow in the Department of Poultry Science in Dale Bumpers College of Agricultural, Food and Life Sciences. The fellowship, supported by a gift from the Walton Charitable Foundation, provides a $30,000 stipend plus full tuition for a doctoral student. The poultry department also offers five doctoral academy fellowships, also supported by the Walton Foundation gift.

"The purpose of these fellowships is to attract the brightest students to the University of Arkansas," said Walter Bottje, department head. "Stacy is certainly one of the brightest," he said. "She was a National Merit student in high school, graduated magna cum laude from Texas A&M University, was in the University of Arkansas Honors Fellow Program while working on her master's degree, and was the graduate Bumpers Scholar last year."

Higgins, working with UA poultry scientist Billy Hargis and other researchers at the Arkansas Agricultural Experiment Station, has isolated harmless bacteria that, when administered to chicken and turkey poults in their water, compete for food and attachment sites in poultry intestinal tracts with Salmonella, *Campylobacter* or other illness-causing bacteria that can contaminate meat during food processing. The process, called competitive exclusion, is a safe alternative to antibiotics. It is also effective in protecting poultry from bacterial infections, Higgins said, and accelerates the birds' natural immunity to harmful bacteria. (See page 11).

UA researchers are also developing bacteriophages, viruses that attack only bacteria, for use in poultry health care and food safety. Bacteriophages occur naturally everywhere, Higgins said.

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

Hargis said the technology of competitive exclusion and bacteriophages have been around a long time and are demonstrated to be safe and environmentally friendly.

Poultry Science Major Ross Wolfenden One of the First to Graduate from Bumpers College Honors Program

FAYETTEVILLE - Ross Wolfenden, a poultry science major and son of Valorie Ross of Berryville was one of the first four graduates of the Bumpers College of Agricultural, Food and Life Sciences Honors Program. The Bumpers College Honors Program is designed for undergraduate students who want to experience firsthand the satisfaction and challenge of completing independent, creative projects or research aimed at discovering new knowledge in close association with faculty mentors.

Students will typically begin the Honors Colloquia during their first semester. The colloquia are offered as a series of five-week courses. In addition to the Honors Orientation, a student must select an additional five blocks to meet their six required hours of Honors Colloquia. Honors Colloquia will be offered each semester as a variable credit course.

All Honors students will be required to develop and complete an Honors project appropriate for their degree and interests to graduate from the Honors Program. Laboratory and field studies and surveys, as well as research accomplished at sites other than on campus or on research stations, are encouraged. Honors students will be required to develop proposals for funding of their projects, as well as to conduct and present their results.

Poultry Science Grad Student Hilary Pavlidis Receives Award at Annual PSA Meeting

DELAWARE - Hilary Pavlidis, master's student of Nick Anthony, from Virginia Beach, Virg., received the Graduate Student Research Paper Certificate of Excellence for Breeding and Genetics at the Poultry Science Association's annual meeting in Delaware.

Her paper was titled "Divergent Selection for Ascites Incidence in Chickens."

Pavlidis received her B.S. from Virginia Tech and is currently working to complete her master's.

U of A Poultry Science Department takes Second Place for Skit at 44th Annual Poultry Festival

HOT SPRINGS - The Poultry Science Department won second place and $750 for its skit, "My Big Fat Greek, Chicken-loving Family," during the 44th Annual Poultry Festival held at the Convention Center in Hot Springs June 7. This is the fourth year in a row the team has scored in the top three.

Members of the skit were Jason Emmert, Diana Bisbee, Gary Davis, Niki Loupe, Beth Hill, Russ Harding, Matt McKinnon, Casey Owens and Lionel Barton.

SECOND PLACE WINNERS - University of Arkansas poultry science students, faculty and staff pose after performing their skit "My Big Fat, Greek Chicken-loving Family" before a crowd at the Poultry Festival in Hot Springs. This year's team won second place overall. Pictured above from left are Jason Emmert, Niki Loupe, Matt McKinnon, Russ Harding, Casey Owens, Beth Hill and Diana Bisbee. Not shown are Gary Davis, who did sound and Lionel Barton, the team cook.

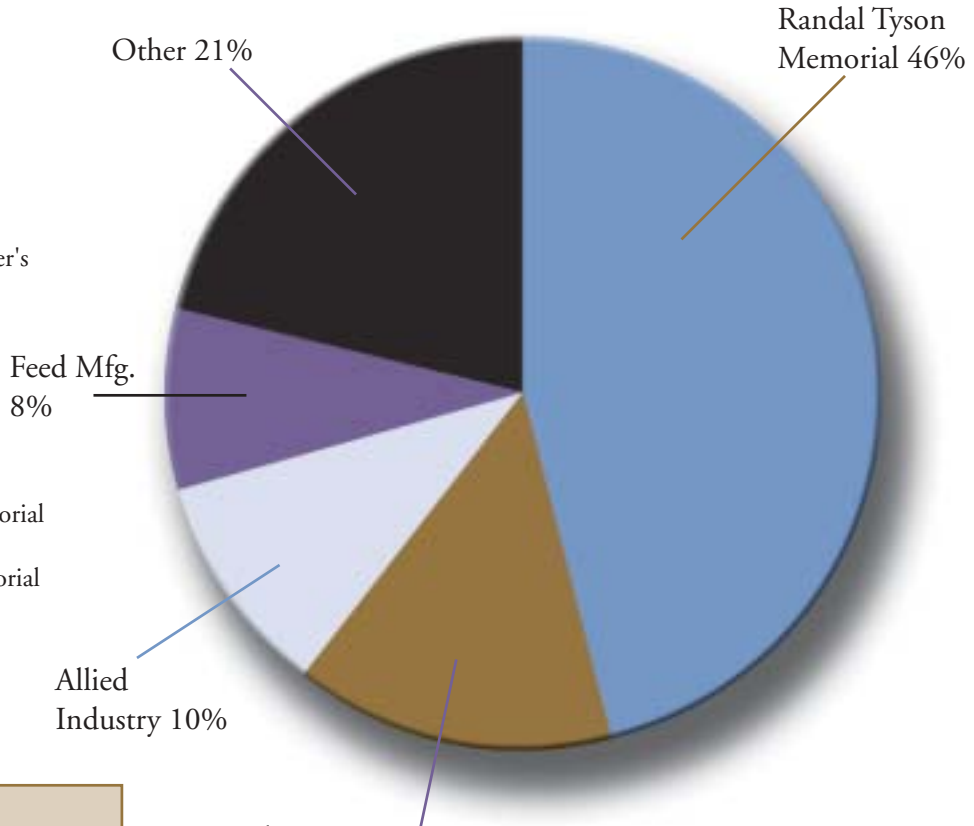
UNIQUE OPPORTUNITY -John Tyson, CEO of Tyson Foods, Inc., visits with poultry science scholarship students during a luncheon on campus. Students took advantage of the visit to thank Mr. Tyson for his generous support of the poultry science scholarship fund.

Poultry Science Majors Receive Outstanding Support from Scholarship Contributions

Name of Student	Name of Scholarship Received 2002/2003
Alston, Mark	Feed Manufacturer's and Randal Tyson Memorial
Baeyens, Katy	Poultry Science Matching/ Randal Tyson Memorial
Bateman, Kristin	Randal Tyson Memorial
Bowen, Olivia	Poultry Science Matching/Randal Tyson Memorial
Bowman, Margaret	Randal Tyson Memorial
Burkett, Chad	Allied Industry and Randal Tyson Memorial
Cole, Ashley	Allied Industry
Conner, Jessica	Poultry Science Matching
Cornelison, Jana	Randal Tyson Memorial
Cox, Ashley	Richard Forsythe
Denham, Sarah	Poultry Science Matching
Devor, Bobbi	Allied Industry
Drake, Amanda	Allied Industry
Drumwright, Alison	Poultry Science Matching
Gannon, Evan	Randal Tyson Memorial
Ganson, Fauna	Randal Tyson Memorial
Griesse, Rachel	Randal Tyson Memorial
Grossman, April	Poultry Science Matching/Randal Tyson Memorial
Hale, Lindsay	Allied Industry
Hall, Bethany	Poultry Science Matching/Randal Tyson Memorial
Harding, Russell	Randal Tyson Memorial
Henderson, Savannah	Randal Tyson Memorial
Hill, Beth	Poultry Science Matching/Randal Tyson Memorial
Holmes, Kara	Allied Industry
Horton, Drew	Poultry Science Matching/Hubbard
Hubbard, Adriane	Randal Tyson Memorial
Hubbard, Robert	Randal Tyson Memorial
Jackson, Britney	Poultry Science Matching
Jarquin, Robin	Randal Tyson Memorial
Jordan, Scott	Allied Industry
Keen, Cody	Allied Industry
Keener, Abby	Randal Tyson Memorial
Keeter, April	Randal Tyson Memorial
Kimble, Brad	Poultry Science Matching

Continued from previous page

Name of Student	Name of Scholarship Received
Lumpkin, Hugh	Grover C. Harris
Outlaw, Benjamin	Feed Manufacturer's
Parker, William (Drew)	Allied Industry and Randal Tyson Memorial
Rowland, Emily	Randal Tyson Memorial and Feed Manufacturer's
Shasteen, Tara	Poultry Science Matching
Sikes, Destiny	Edmiston
Sink, Joshua	Randal Tyson Memorial
Sossamon, Sarah	James Whitmore
Stinnett, Ashley	Tal Nalson
Swonger, Sidney	RandalTyson Memorial
Townsend, Julie	E.L. Stephenson
Van Brunt, Jarrod	Darryle and Peggy Greene/Randal Tyson Memorial
Waddell, Mindy	Henry B. Shreve/Randal Tyson Memorial
Webber, Daniel	Poultry Science Matching/Randal Tyson Memorial
Williams, Austin	Randal Tyson Memorial
Wolfenden, Ross	Allied Industry
Wright, Eric	Hubbard



2002-2003 Scholarship Breakdown

Scholarship	Fall 2002	Spring 2003	Total	% of Total
Tyson	22,400	33,900	56,300	46
Matching	17,500	300	17,800	15
Allied	8,250	4,125	12,375	10
Feed Manufacturer's	5,000	5,000	10,000	8
Other	14,250	11,750	26,000	21
	67,400	55,075	122,475	100

TAKE A CLOSER LOOK-Service is an important component of our faculty's contribution to the industry and to the field of science. Take a moment to look over the names and the committees and organizations they serve with, you will begin to realize the scope of our reach into our state, our region, our nation and our world.

Faculty Service

Nick Anthony
- Poultry Science Association
  - Section Editor; Breeding and Genetics
- University, Honors Program (transition team)
- ACTA (Arkansas Consortium for Teaching Agriculture)

Walter Bottje
- Director, Center of Excellence for Poultry Science
- Poultry Science Association
  - Graduate Student Awards Committee
  - Research Award Committee

Keith Bramwell
- Poultry Science Association
  - Physiology & Reproduction Section, reviewer
- Journal of Applied Poultry Research, reviewer
- North American Gamebird Association
- Southeastern Gamebird Breeders Association

H. David Chapman
- Chair, Department Promotion & Tenure Committee
- Member, College Promotion & Tenure Committee
- Poultry Science Association
  - Associate Editor
  - Drugs and Chemicals Committee
- USDA Review Panel - ARS Parasitology Units
- FASS Committee on Food Safety, Animal Drugs and Animal Health

F. Dustan Clark
- Arkansas Animal Emergency Disease Response Task Force Member
- Arkansas Poultry Veterinary Association, Secretary/Treasurer
- American College of Poultry Veterinarians
  - Diplomate
- American Veterinary Medical Association

Faculty Service that Makes A Difference...Setting Our Sights Beyond the Horizon

Craig Coon
- Ad Hoc Manuscript reviews for Poultry Science
- Ad Hoc Manuscript reviews for British Journal of Poultry Science
- Ad Hoc Manuscript reviews for World's Poultry
- Farm User's Committee
- Feed Mill Manager Committee

James Denton
- USDA National Advisory Committee for Meat and Poultry Inspection
- Poultry Science Association
  - International HACCP Alliance, Board
- National Alliance for Food Safety, Board
  - Chairman of the Operations Committee
- The Poultry Federation
  - Board of Directors, ex officio
  - Technical Advisory Committee, Executive Vice Chairman

Dan Donoghue
- Poultry Science Association
  - Society for the Advancement of Science, liaison
  - Associate Editor, Physiology Section
  - Committee on Drugs and Chemicals
- Ad Hoc Reviewer, Archives of Environmental Contamination and Toxicology
- Agency Task Force, National Alliance for Food Safety (NAFSS)

Jason Emmert
- Coordinator of the Poultry Science Department Scholarship Program
- Department Advising Committee, Chair
- Department Curriculum Committee, Chair
- Poultry Science Association
  - Associate Editor for the Nutrition Section
- National FFA Career Development Event Committee and Organizer

Gisela Erf
- Cell Characterization Facility, Director
- Poultry Science Association
  - Associate Editor, Immunology Section
  - Poultry Science Genetic Section
  - Purina Mills Teaching Award Committee
- Co-organizer of the PSA 2003 Ancillary Symposium
- Pan American Society for Pigment Cell Research
- Avian Immunology Research Group
- NE-60 Multi-state Project, Chair-elect
- Avian Immunology Advisory Panel, Roche Vitamins

H.L. Goodwin, Jr.
- AAEA International Committee and Editorial Reviewer
- Editorial Reviewer - AAEA, SAEA, IAMA
- University of Arkansas Fringe Benefits Committee
- AAED Recruitment Committee

Billy Hargis
- Poultry Health Research Laboratory, Director
- Poultry Health Research Advisory Committee, Chair
- Poultry Science Association
  - Liaison to Southern Poultry Science Society
- Southern Poultry Science Society, Nominations Chair
- Ad Hoc Reviewer for USDA, USDA-SBIR, BAIRD, PSA, JAPS
- Diplomate of the American College of Poultry Veterinarians
- AAAP Environment Committee

Frank Jones
- Extension Section Leader, Poultry Science
- Avian Advice, Editor
- Short Course, Coordinator
- HACCP Roundtable, Co-coordinator
- Faculty Liaison for Applied Broiler Research Unit, Savoy

John Kirby
- Director, Program in Cell and Molecular Biology
- Research Initiation Grants Program Committee, Chair

KIRBY - Continued on next page

INTERNATIONAL SHORT COURSE ON MODERN POULTRY PRODUCTION - From left, Doug Archer, assistant hatchery manager for George's Inc., explains to Eugene Rodberg (hidden), senior marketing manager for DSM Nutritional Products, Inc.; Traci Sayer, laboratory manager for Anitox, and Gilbert Weber, Global Technical Services, the operation of an Inovoject® system, which injects chicks with vaccines prior to hatching, during one of the sessions held during an International Short Course on Modern Poultry Production at the Center of Excellence for Poultry Science. The short course is just one of the many workshops and symposiums hosted by the Center each year to further education opportunities with our industry partners.

Faculty Service continued

JOHN KIRBY - Continued from previous page
- Institutional Animal Care and Use Committee, Chair
- Core DNA Technology Lab Organizing Committee, Chair
- Poultry Science Association
  - Associate Editor
  - Research Award Committee
- Member Avian Reagents Task-Force
- Ad Hoc Reviewer for the Biology of Reproduction

Wayne Kuenzel
- Poultry Science Association
  - Board of Directors
  - Merck Achievement in Poultry Science Award Committee on Animal Care
- Reviewer of Manuscripts submitted to Poultry Science, Anatomical Record, Physiology and Behavior, Brain Research Bulletin, Journal of Comparative Neurology, and Psychoneuroendocrinology

Young Min Kwon
- Poultry Science Association, Reviewer

John Marcy
- Conference for Food Protection
  - Executive Board Member
  - Program Co-Chair for the Conference (2002)
- National Academy of Science Committee on Review of the use of microbial performance standards for foods and the meat and poultry subcommittee
- HACCP Roundtable, Co-coordinator
- HACCP Roundtable Further Processing

Yanbin Li
- ASAE Be 23 Biosensors Committee, Chair
- ASAE FPE 703 Food Processing Committee, Chair/Past Chair
- ASAE Membership Editorial Board
- IAFP Professional Development Groups of Poultry & Meat Products and Risk Assessment
- Federation of Associations of Chinese Professionals in Southern USA, Board of Directors

Faculty Service continued

College of Animal Sciences and Technology, Zhejiang University, Adjunct
College of Agricultural Engineering and Food Science, Shenyang Agricultural University, Adjunct

Lisa Newberry
- Poultry Health Research Advisory Committee
- Northwest Arkansas Turkey Health Research Advisory Committee, co-founder
- AAAP Enteric Disease Committee

Ron Okimoto
- Poultry Health Laboratory Committee
- Institutional Animal Care & Use Committee
- Ad Hoc reviewer for Animal Genetics
- Poultry Science Association, Associate Editor
- Interdisciplinary Molecular Biology Program
- Member NC-168 and NRSP-8

Casey Owens
- Graduate Admissions Committee
- Departmental Curriculum Committee
- Councilor to the Ozark IFT Section

Mark Parcells
- University Institutional Biosafety Committee
- Cell and Molecular Biology Faculty Steering Committee
- Ad Hoc Reviewer, Journal of Infectious Diseases, Journal of Clinical Microbiology, Proceedings of the National Academy of Sciences, and Virus Genes
- US-AID International Grant Ad Hoc, Reviewer

Michael Slavik
- Graduate Student Admissions, Chair
- USDA / CREES Food Safety Consortium
- Reviewer for National Research Initiative Competition Grants Animal Health and Well-Being Program
- Editorial Board of the Journal of Rapid Methods and Automation and Journal of Food Protection
- Ad Hoc Reviewer for the Journal of Food Science

Park Waldroup
- Departmental Adjunct Professor Committee, Chair
- Poultry Nutrition Subcommittee of the National Research Council
- Journal of Applied Poultry Research, Associate Editor
- Poultry Science, Associate Editor
- Journal of Nutrition, reviewer

Susan Watkins
- WCC-59 Regional Project, Secretary
- Poultry Science Association, Associate Editor
- Member, Tyson Foods, Health Award Committee
- National Waste Management Symposium, organizer
- Annual Poultry Symposium, organizer
- America's Clean Water Foundation training for On-Farm Environmental Auditors, host
- The Poultry Federation
  - Poultry Improvement Committee (PIC)
  - The Turkey Committee, secretary
- U.S. Poultry & Egg, Student Advisory Committee

Robert Wideman, Jr.
- Associate Director of Center of Excellence
- Poultry Science Association
  - Board of Directors
  - Constitution Committee
  - Board Liaison to the Extension Committee
  - Board Liaison to the FASS Committee
  - Associate Editor for the Physiology and Reproduction Sections
- Journal of Applied Poultry Research, Editorial/Review Board
- Federation of Animal Science Societies
  - Board of Directors

Jerry Wooley
- National 4-H Poultry and Egg Conference
  - Dressed Market Chairman, Poultry Judging Contest
- Arkansas State Fair & Livestock Show
  - Poultry Superintendent
- Arkansas 4-H Barbecue Contest, organizer

WATER QUALITY - Water quality is an important issue in the poultry industry. Extension specialist Susan Watkins has led symposiums on water quality for industry representatives in an effort to provide the industry with unbiased information on water treatments.

Drinking Water Quality Becomes a Top Focus for the Poultry Industry

As with every industry, trends come and go, but when it comes to focusing on improving drinking water quality, poultry companies are seeing dramatic results. Last year extension specialist Susan Watkins hosted a day long symposium focused on defining water quality standards for poultry and then showcasing different methods for meeting those standards.

For companies like Pilgrim's Pride, the information has had a tremendous impact on improving livability, feed conversions and weight gains. Grow-out manager Kevin McDaniel told growers at one of a series of grower meetings focused on water quality that providing clean, sanitized water to the birds would give them one of their greatest returns on investment.

Through Watkins research and extension efforts, poultry companies are being provided with unbiased information on water treatments, disinfectants and ways to measure water quality.

SATISFYING - Peter Liu, son of a research associate Frances Yan, enjoys a tall, refreshing glass of water.

Ozark Poultry Producer Symposium Takes Place on UA Campus

FAYETTEVILLE - The Ozark Poultry Producer Symposium took place on Wednesday, May 15 at the Pauline Whitaker Animal Science Center on the University of Arkansas campus. This symposium is an annual event and is open to growers, poultry producers and the poultry industry as a whole.

"This is a tremendous opportunity for growers to have access to a variety of experts in the field," said Susan Watkins, extension poultry specialist and organizer of the event. "This type of opportunity doesn't occur very often and we're delighted the presenters made themselves available for our conference."

Topics of interest during the one-day symposium are: 1) Utilizing Credit Lines for Operating Capital, 2) Watershed Restoration and Rehabilitation, 3) Brooding Chicks, 4) Flock Management to Optimize Health: Ask the Experts Vet Panel, 5) Local Environmental Update, 6) America's Clean Water Foundation On-farm Environmental Audit Program and A Grower's Perspective of the On-farm Audit, 7) EPA Update on Watershed Management, 8) Ways to Conserve Energy to Save on Utility Bills, 9) Keeping Flocks Healthy when Antibiotics are Not an Option, 10) Arkansas Emergency Disease Response Plan: Implications of an Infectious Disease Outbreak for the Poultry Industry.

Cost of the symposium was $15 at the door. Preregistration at a discounted rate ($10) was available through County Extension Offices or by contacting the Center of Excellence for Poultry Science.

Additionally, there was a vendor trade show that featured products such as water additives, poultry health products and poultry house equipment.

This event was sponsored by the Arkansas Cooperative Extension Service, The Poultry Federation, The Center of Excellence for Poultry Science and the Washington County Economic Development Advisory Board.

International Short Course on Modern Poultry Production a Success

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

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

Most participants in the short course are allied industry technical representatives, poultry industry representatives, who want to gain a broader knowledge of poultry production methods, and international poultry producers. This year the international participants came from England, Uganda and Switzerland. In the past three years there have been participants from 10 countries worldwide.

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

Some of the hands-on workshops include the following: industry structure; anatomy and physiology of the chicken; breeders and breeder management; hatchery management; broiler production; processing; further processing; food safety and economics of decision-making.

Dates for next year's short courses are Feb. 23-27 and Sept. 27-Oct. 1, 2004. For more information about the International Short Course in Modern Poultry Production, contact Frank Jones through e-mail, ftjones@uark.edu, or by phone (479) 575-5443.

This event was sponsored by the Arkansas Cooperative Extension Service and the Center of Excellence for Poultry Science

TAKING MEASUREMENTS - John Marcy, far right, takes measurements on chicken breasts to ensure proper cooking temperature.

Thermal Processing and Validation Workshops organized on UA Campus to Assist Employees Who Handle Food

FAYETTEVILLE - John Marcy, Extension food scientist and Poultry Processing Specialist at the Center of Excellence for Poultry Science in cooperation with Rong Murphy, (UA Bio and Ag Engineering) have organized and hosted several Thermal Processing and Validation Workshops at the Center.

HACCP and Process Control Quality Assurance in the food industry is critical to controlling the spread of foodborne illnesses. The Thermal Processing and Validation Workshops were instigated as part of an USDA Integrated Food Safety Grant to conduct research and Extension in the area of understanding thermal process requirements and how to validate thermal processes to help inform industry employees, handling food products, of important information and regulations.

Workshop sessions include discussion on current regulatory issues, balancing food safety and quality, frying technology, post-processing environmental control, statistical sampling and risk reduction, post-process pasteurization issues and technology.

DOING RESEARCH - Brandon Beard, program technician, is shown conducting research at the University of Arkansas in the area of thermal processing and validation.

Ozark Poultry: New Laws Regulate Use, Disposal of Poultry Litter

FAYETTEVILLE --- Poultry litter, as a source of cheap fertilizer, has helped turn Ozark pastures into lush, productive fields for cattle and hay, but the nutrient content of the litter has become too much of a good thing.

The U.S. poultry industry produces 6.12 million tons of manure per year from broilers, said Glenn Carpenter, agricultural economist for the National Resource Conservation Service. "It would make a row three feet wide by three feet high that would stretch twice across the country," he told poultry producers attending the University of Arkansas Division of Agriculture's Poultry Producer Symposium Sept. 9.

Carpenter said confined animal operations, including poultry farms, have become concentrated into fewer areas, like northwest Arkansas. Excess phosphorus from the litter applied to pastures becomes a pollution source that runs off into streams and other bodies of water.

The Arkansas Legislature passed three laws in 2003 to regulate use and management of poultry litter and other nutrients.

"The goal of these laws is to preserve water quality in the state without creating an unnecessary burden on poultry and livestock producers," said H.L. Goodwin, agricultural economist for the University of Arkansas Division of Agriculture and poultry Extension economist.

"In some areas, like the Eucha-Spavinaw watershed in Benton County, where nutrients can no longer be applied to the land, the economic impact could be significant," Goodwin said. "Producers in such areas have lost the value of their litter and will have to replace it with something else or reduce productivity."

In other areas, where mandated nutrient management plans permit producers to continue using litter as fertilizer, Goodwin said the economic impact will be minimal. "It's going to be more of a management inconvenience than anything else."

Janie Hipp, Extension agricultural lawyer for the Division of Agriculture, said the new laws establish "nutrient surplus areas" that include all or part of counties extending from Benton County in the west to Baxter County in the east, and from Benton County in the north to Polk County in the south.

Hipp said the laws also require: certifying all those who apply nutrients to crops or pasture land; certifying nutrient management plan writers; registering all poultry feeding operations; and developing and implementing nutrient management and poultry litter management plans within nutrient surplus areas.

"Besides agricultural land, the laws apply to residential and commercial land more than 2.5 acres in size," Hipp said.

She said the Arkansas Soil and Water Conservation Commission is writing the regulations that will implement the laws.

Goodwin said the laws represent some changes in how litter and other nutrient sources will be managed, but much of what the laws require is already in practice. "Most people don't want to mess up the environment," he said. "They want to manage nutrients properly and in a manner that provides the most value."

Goodwin has a $192,000 grant from the Arkansas Soil and Water Conservation Commission to conduct a feasibility study for establishing an Ozark litter bank to handle surplus poultry litter.

"A litter bank is a means of distributing litter from areas with a surplus to other areas that can use the nutrients," he said. "It requires a rational, organized plan to move it to another place where there's no environmental issue, such as the Delta or other Midwestern states, or to turn it into another product."

The feasibility study will take two years, but Goodwin will focus on key issues first because, he said, western Arkansas doesn't have two years to wait before doing something about litter surpluses. The study will concentrate on where to establish a litter bank, finding buyers, establishing transportation networks and determining how much it will cost to set the whole thing up.

A fact sheet, written by Goodwin, Hipp and Extension poultry specialists Frank Jones and Susan Watkins, describes the nutrient management laws and how they affect Arkansans. It is available from county Extension offices.

WORKING FOR THEIR LUNCH - Nineteen students from around Arkansas attended the Poultry Science Youth Conference at the Center of Excellence for Poultry Science on the University of Arkansas campus. Here the youth are shown at Tyson Foods, Inc., research and development kitchen learning how to bread fillets that will later serve as their lunch.

THE WHOLE GROUP - Here the youth are shown at Devil's Den State Park for an afternoon of fun and a cookout sponsored by the industry.

Poultry Science Youth Conference a Key in Informing Kids About and Recruiting Students to Poultry Science

FAYETTEVILLE –Nineteen high school students and two educators from around the state experienced college life firsthand at the University of Arkansas while attending the seventh annual Poultry Science Youth Conference sponsored by the Center of Excellence for Poultry Science (CEPS) and in partnership with the Cooperative Extension Service July 15-18.

The conference is designed to foster interest in the poultry industry, the University of Arkansas and the UA poultry science department through industry tours, scientific and informative sessions and recreation. This conference is also open to all agricultural educators who would like a more in-depth view of the poultry science department at the U of A. Many students were contacted by their County Extension agent to participate.

During the conference, participants toured Cargill's state-of-the-art turkey processing plant and Tyson's world headquarters, both located in Springdale. While at Tyson's, the students participated in a hands-on project in the research and development kitchen and were able to learn how Tyson breads chicken nuggets and breasts for commercial sale. After assembling the breasts and tenders, students actually got to eat their own product for lunch in Tyson's cafeteria.

During break-out sessions on the UA Fayetteville campus, students were able to monitor a chicken's heart rate, mix feed at the UA Feed Mill and identify different types of bacteria by running specialized tests. These sessions exposed students to the wide variety of careers involved in poultry science.

Recreational activities during the week included a cookout at Devil's Den State Park, dinners at Tiny Tim's Pizza on the downtown Fayetteville square and Jose's on Dickson Street, putt-putt golf at Gator Golf and go-cart riding at Lokomotion Family Fun Park. On the final night of the conference, students enjoyed participating in a murder mystery game at the Center. The theme of this year's conference was "Get a Clue."

Sponsors of the conference were the Farm Bureau, Harold E. Ford Foundation and the Center of Excellence for Poultry Science.

Next year's conference will be held in July and information can be obtained by e-mailing Gary Davis, poultry science undergraduate recruiter, at gddavis@uark.edu or Jerry Wooley, Extension specialist at jwooley@uaex.edu. All students completing the 10th and 11th grades are invited to attend. Space is limited.

CHECKING FOR WEST NILE VIRUS - Above Extension Poultry Health Veterinarian Dustan Clark checks over a bird brought to the Broiler Show. This year at the Broiler Show in Little Rock, the health department was present and collected blood samples from the birds to test for West Nile Virus. West Nile Virus does not affect chickens, but they do develop antibodies to the virus. The health department was collecting blood to determine how widespread West Nile Virus is in Arkansas.

WAITING THEIR TURN - Children participating in the broiler judging at the State Fair Broiler Show are pictured waiting their turn, while Jerry Wooley, Extension Specialist and coordinator of the event looks on.

Youth Poultry Program Creates Awareness about Poultry Industry

LITTLE ROCK –Each year the Youth Poultry Program, coordinated by the Cooperative Extension Service and the Center of Excellence for Poultry Science, creates awareness about the poultry industry and its career opportunities for young people who train and prepare themselves in the field of poultry science.

The Youth Broiler and Turkey Program and the 4-H Poultry Chain Projects bring family members together working with a live animal project. In fiscal year 2003, the 4-H Poultry Chain Project grew to a record number of participants and pullet chicks placed. This year, 21,095 white pullet chicks and 8,475 brown pullet chicks were placed with more than 800 youth around the State of Arkansas.

During the summer, chicks are banded by the Poultry Science Club of the University of Arkansas and distributed to children wishing to participate. There is a very nominal fee for the purchase of the chicks, thereby increasing the opportunity for more youth to participate.

When it's time for the State Fair in Little Rock, children participating in the poultry chain project select their five best birds for competition. Two of the five birds are culled, and the remaining three are judged on consistency, breast yield, size and overall appearance. The children themselves show their birds and compete for placement in the top 33 spots. Winning birds are then "auctioned off" at the fair.

The 4-H Poultry Chain's largest sponsor is Cal-Maine Food of Lincoln, Ark. Cal-Maine donated 5,000 pullets and Hy-line donated 2,000 and sold us 14,000 more at their cost. The project is very popular among many low-income youth who cannot afford a large animal project. The project provides learning experience in brooding, rearing, and management of live birds.

THE WHOLE POULTRY FAMILY - Members of the Department of Poultry Science faculty, staff and students stop on the back steps of the building to pose for a photo for the Razorback Yearbook. This was a rare opportunity to gather most of the employees in the poultry science department at one place. Special events for the department happen throughout the entire year. Each December, the department hosts a holiday party for employees, spouses and children. In November and December, each floor in the Center of Excellence challenges one another to a contest to see which floor can bring the most nonperishable food items to be donated to those in need in partnership with the Poultry Science Club. In the summer, the farm employees treat the entire department and their families to a cookout at AGRI park. We truly are one big family. Thank you for this opportunity to share a glimpse of the happenings in poultry science by way of this Annual Report. We strive to continue forward in the future, while building on our terrific past.

information and contacts...

Publications

Book Chapters	*5*
Refereed Publications and Proceedings	*55*
Unrefereed Publications and Proceedings	*17*
Invited Lectures	*27*
Other Lectures, Papers and Oral Presentations	*123*
Other Creative Endeavors - Workshops	*3*
Patents/Patent Application	*10*

Contact Information:

Walter Bottje, Director, E-mail: wbottje@uark.edu
Nick Anthony, Teaching Program Coordinator, E-mail: nanthony@uark.edu
Jason Emmert, Undergrad Curriculum Coordinator, E-mail: jemmert@uark.edu
Billy Hargis, Poultry Health Lab Director, E-mail: bhargis@uark.edu
Frank Jones, Extension Section Leader, E-mail: ftjones@uark.edu
John Kirby, DNA Sequencing Lab Director, E-mail: jkirby@uark.edu
Michael Slavik, Graduate Student Recruitment Coordinator, mslavik@uark.edu
Susan Watkins, Internship Coordinator, E-mail: swatkin@uark.edu
Bob Wideman, Associate Director, E-mail: rwideman@uark.edu

Howard Lester, Co-Manager Research Farm & Feed Mill, E-mail: hlester@uark.edu
Rodney Wolfe, Co-Manager Research Farm & Processing Plant, E-mail: rwolfe@uark.edu
Judy England, Manager Broiler Breeder Research Farm, E-mail: jengland@uark.edu

Diana Bisbee, Program Director, POSC Alumni Organization contact, E-mail: dbisbee@uark.edu
Gary Davis, Undergraduate Recruitment Coordinator, E-mail: gddavis@uark.edu
Karen Eskew, Communications, E-mail: keskew@uark.edu

UNIVERSITY of ARKANSAS
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of AGRICULTURAL, FOOD AND LIFE SCIENCES

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