

Testimony presented to:

**Subcommittee on Biotechnology, Horticulture and Research
U.S. House of Representatives Agriculture Committee**

**Public Hearing to Highlight Research Innovations Achieved by Our Nations
Agricultural Colleges and Universities**

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I am honored to have the opportunity to represent the University of Georgia College of Agricultural and Environmental Sciences and all land-grant universities across the nation and to provide to the Subcommittee on Biotechnology, Horticulture and Research of the U.S House of Representatives Agriculture Committee testimony on the intrinsic value and vital role public university research plays in keeping American agriculture strong, our economy growing and the people of the world nourished.

First, I want to thank you for your past support of our research programs, and I ask for your continued support of this critical component of our nation's economy and basic security. All agricultural research is important; however, in this brief testimony I believe it is best for me to focus primarily on my area of expertise, poultry science.

Nowhere else is agricultural research so open and readily accessible to farmers and consumers as it is in the U.S. This unique quest for and application of new information and ideas relevant to agriculture is directly attributable to our land-grant university system. The land-grant model, coupled with USDA-ARS, form a powerful combination that is the envy of the world in its effectiveness at addressing the critical needs of food production.

A great example of land-grant and USDA collaboration is the relationship between the University of Georgia and USDA in addressing the threat of Avian Influenza (AI). Earlier this year, the U.S. faced a renewed threat to our food security as AI spread across 21 western and central states, resulting in the loss of almost 50 million birds including 16 percent of the nation's egg producing flocks.

As the waterfowl that carry the AI virus migrate south this fall, the threat of this disease intensifies in Georgia. Because of the size and importance of poultry in Georgia, the leading producer of poultry in the U.S., a serious AI outbreak in our state would be devastating to our economy and impact the U.S. food supply.

Poultry scientists and veterinarians at USDA, the University of Georgia and at scores of other land-grant universities across the country have been conducting applied research and extension programs to help poultry producers strengthen biosecurity procedures to protect the nation's poultry flocks from AI. They also have been working tirelessly on research related to response plans including humane euthanasia methods and composting mass mortalities in the event of a catastrophic AI outbreak.

This unexpected threat to poultry production in the U.S. underscores the critical need for a strong animal/poultry research infrastructure to address and respond to future major threats to animal agriculture that no one can currently predict but are almost assuredly to occur.

The USDA Southeast Poultry Research Laboratory (SEPRL) in Athens, GA is recognized as one of the leading poultry disease research facilities in the world. The work done there is of immeasurable importance to protecting the health of the nation's poultry flocks. The need for the funding recommended to expand and modernize the research facilities at SEPRL is strategic and vital as the serious consequences of the current AI situation highlight vividly.

In concert with the heightened biosecurity efforts of Georgia's poultry producers, the University of Georgia's 4-H program is developing and piloting a program with the Centers for Disease Control and Prevention to teach biosecurity principles to even our youngest citizens, helping them better understand and prevent disease transmission between animals and from animals to humans.

Poultry and eggs are a major protein source important in providing vital nutrition for people around the world. We take the responsibility of producing safe, affordable and high-quality meat and eggs seriously, and will continue to be vigilant in our quest to address diseases that threaten the flow of food and commerce. By addressing biosecurity at all levels of our society, we are better protecting our people, our animals and our agricultural economy.

Other research innovations related to poultry health include one of the most promising long-term solutions to disease prevention – development of genetic resistance. At the University of Georgia, scientists are working at the basic level to enhance genetic resistance to viral respiratory diseases such as AI, Newcastle, Infectious Bronchitis, and Laryngotracheitis. These diseases are a considerable threat to the U.S. poultry industry, but in developing counties they frequently devastate entire flocks and can wipe out farmers' hopes of feeding their families.

Land-grant universities are improving animal health and protecting the environment through better nutrition. Poultry do not have enzymes necessary to breakdown phytate phosphorous contained in typical corn/soy diets. Poultry nutritionists have identified and commercialized phytase enzymes that are now added to most poultry diets in order to improve the utilization of this previously unavailable phosphorous source. These enzymes reduce the need for inorganic phosphorous to be added to diets. They also

reduce the amount of phosphorous contained in poultry manure, thereby improving the nitrogen-to-phosphorous ratio in the manure and making it a more effective organic fertilizer.

Animal production is an important user, and in many cases the only user, of byproducts of biofuel production, human food production and industrial production. The University of Georgia has been a leader in analyzing and providing research-based recommendations on the use of alternative feed ingredients in poultry feeds. These studies have effectively recycled byproducts, reduced costs for poultry producers and kept millions of tons of material out of landfills and other waste streams.

Food safety, water conservation and waste minimization as related to poultry processing are high priorities for the poultry industry. UGA and other land-grant laboratories, in partnership with federal poultry labs, are developing new processing methods looking at a systems approach. Scientists and engineers from a number of institutions are collaborating to examine poultry processing from the hatchery to the marketplace to enhance food safety, energy efficiency, and environmental stewardship. Research conducted at land-grant universities has been key in reducing foodborne pathogens on poultry products.

Consumer and industry interest in reducing drugs and chemicals in poultry production has spurred research on vaccines to protect poultry from parasitical diseases such as coccidiosis. Variants of the protozoa that cause this disease have been isolated that allow poultry to develop resistance without causing the severe production losses associated with the disease. These variants have been successfully employed in safe and effective vaccines that are now used extensively in poultry production.

Essentially all the research done at universities these days is multidisciplinary. Agricultural engineers and poultry scientists at the University of Georgia teamed up to address the long-standing problem of heat stress in meat-type chickens (broilers). This work resulted in development of cost effective tunnel ventilation and evaporative cooling systems which have virtually eliminated heat related mortality and decreased growth and efficiency of broilers during the hot summer months. The value of this research to Georgia poultry producers is estimated at \$15 million annually. These ventilation systems and poultry housing designs are now the standard throughout U.S. and the world.

As described clearly in the recent National Academy of Science (NAS) report, “Critical Role of Animal Science Research in Food Security and Sustainability,” the importance of animal/poultry production to food security and economic development is significant. Animal protein products account for 60-70 percent of the total U.S. agricultural economy. Estimates are that the combination of increased population and rising middle class in numbers of developing countries will result in a 73 percent increase in animal protein demand by 2050.

The amount of research funding focused on animal/poultry research is alarmingly small relative to animal agriculture’s economic impact and future expectations. USDA-ARS

allocates 50 percent more to research related to plant crops and a greater percentage of its budget to environmental issues, food safety and nutrition than to animal production research. The NAS report referred to above states: “In the past two decades, public funding, including formula funding and USDA-ARS/NIFA funding, of animal science research has been stagnant in terms of real dollars and has declined in relation to research inflation rate.” Further, “animal agricultural research has borne the brunt of decades of neglect,” in regard to research funding.

Even so, the results of the modest public research investment that has been made in animal research are truly remarkable. For example, in 1960 it took over 100 days to grow a meat-type chicken to a market weight of 5 pounds; today it takes less than 45 days. During the same time period, feed efficiency improved from 2.5 pounds of feed required to produce a pound of chicken to just 1.7 pounds today; and poultry geneticists predict feed efficiencies will approach 1.2 in the next two decades. Annual egg production has improved from 230 eggs per hen in the 1960 to 300 eggs per hen currently. Similar improvements have been realized in poultry health and livability. These production and efficiency advancements have allowed for significant improvement in sustainability and amazing reductions in the environmental footprint of poultry production relative to water, feed and waste-per-pound of poultry meat and eggs produced.

The value of the application of the research findings produced by our land-grant universities is significant, but equally valuable is the undergraduate and graduate training provided by our scientists. This development of human capital and training of the next generation of scientists that our nation needs to assure continued progress and success in food security may be the most important byproduct of the research funding you provide. The NAS report emphasizes the need to “revitalize research infrastructure (human and physical resources).”

Because of the historic funding shortfall and the future demand for increased animal protein production, the need for additional investment in animal science research is nothing less than critical. I do wish to thank the Committee for authorizing the extension of the Animal Health Research and Disease Section 1433 program. Full funding of the Section 1433 program is needed to address the priorities of food security, One Health and environmental stewardship. When that funding is provided, animal and poultry scientists will use it wisely and efficiently. The animal science research community and industry counterparts came together in 2012 and identified research priorities detailed in the Farm Animal Integrated Research report (FAIR 2012). We have a well-thought-out blueprint and are prepared to meet the challenges and address the issues facing the future of animal agriculture.

I will conclude on an economic note. Poultry’s estimated economic impact in the U.S. is over \$150 billion annually; \$30 billion in Georgia alone. Poultry provides over 120,000 jobs in Georgia and over 500,000 nationwide. Animal and poultry agriculture contributes over \$43 billion annually to our nation’s trade balance. Poultry and animal products are an important source of affordable, high-quality protein to feed the world. Enhanced funding for animal research is an investment our country needs in order for the U.S. to

continue to be the global leader in poultry and animal production. Investment in animal agriculture research will continue to pay significant dividends in improved health, environmental sustainability, food security and prosperity for farmers, consumers and society.

As with any investment, there must be an expectation of return, and our track record in this regard stands out. More than 20 independent studies over the past few decades consistently show that for every \$1 invested in agricultural research \$10 is returned.

Again, I wish to express gratitude for this opportunity to provide testimony to the House Subcommittee on Biotechnology, Horticulture and Research. Your interest in and support of agriculture research is appreciated by those of us working to help provide food security for our country and the world. The funding you provide is important; however, your acknowledgement, interest and encouragement in regard to the importance of our research, extension and education programs continue to inspire and motivate us. Thank you for the foresight you have in regard to providing the essential funding required to accomplish this critical work.