Supporting the Poultry Industry: Agricultural Technology Research Program Celebrates Four Decades of Service

BY ANGELA COLAR
Editor

It began with a phone call. The year was 1973 and Georgia’s poultry industry was looking to grow through innovation. Having received a unique request from the industry, the Georgia Poultry Federation placed a call that turned out to be an extremely important one for then and the future.

“In the early 1970s, when I was serving on a Board of Regents Committee establishing a service enabling any citizen with a need to call one number and be referred to an expert in the University System, I received an inquiry about a noise problem in a poultry processing plant. I called the number in the morning to test the system and by the afternoon a meeting had been set up with Georgia Tech. Today, ATRP is a fully matured program and a key part of GTRI. Its collaborative efforts with the poultry industry have been very productive. I don’t know of a better public-private partnership,” recalled Abit Massey, president emeritus of the Georgia Poultry Federation.

On April 23, Massey joined a distinguished group of speakers who marked the Agricultural Technology Research Program’s 40th Anniversary during an afternoon celebration held at the Georgia Tech Research Institute’s Food Processing Technology Building. The event included current and former researchers and staff, industry stakeholders, and representatives from the Georgia Tech community.

For four decades, ATRP has been proud to support the growing needs of Georgia’s dynamic poultry industry. With funding from the State of Georgia and in cooperation with the Georgia Poultry Federation, ATRP has been a driving force in developing new technologies that enhance the industry’s productivity and efficiency, and is recognized as one of the best university-based engineering R&D programs focused on the poultry industry. In addition to seeking solutions to today’s challenges, the program concentrates on transformational innovations that are essential for a viable industry in the future.

“This program has evolved step-by-step with the industry. There was always that link, and I think that is why the program is so successful. There are countless examples of innovations, transformational and incremental, that have made a difference to the poultry industry, and we are looking forward to the next 40 years,” said Mike Giles, current president of the Georgia Poultry Federation.

Indeed, a strong partnership with Georgia’s poultry industry is a hallmark of ATRP. Noting Georgia Tech’s strategic goal of doubling the amount of work it does for industry in the next five years, GTRI Director Bob McGrath said he views ATRP as the prototype of what Georgia Tech is trying to accomplish with other industries. “This is exactly what I think Georgia Tech’s partnership with industry should look like ... where you the industry come in and tell us what you need, where we have great and sustained support from our state government that provides modest resources to let us work with you to understand and develop high-tech solutions to your problems.”

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In what he called a homecoming, Craig Wyvill, retired ATRP director who spearheaded the program’s phenomenal growth, reflected on two of his proudest moments from ATRP’s history. He told the crowd that the program actually spawned Georgia Tech’s Material Handling Research Center in the 1980s and served as the prototype for the development of Georgia’s Traditional Industries Program for Food Processing in the 1990s. “There are a lot of good things that happen when you have the synergy of a program like this,” remarked Wyvill.

ATRP’s mission is to support the economic growth of Georgia agribusiness, especially the poultry industry, through research, education, technical assistance, and outreach. Gary Black, commissioner of the Georgia Department of Agriculture, stressed the importance of university research to the economic development of a state, particularly the creation of jobs. “Anytime we have a chance in our research institutions to make investments that will generate intellectual capital that will transmit into an industry, that means not just Georgia-grown intellectual capital but Georgia-grown jobs for our future. The importance of that cannot be overstated, and our commitment to that must not waiver.”

“The strength of ATRP lies with all the great people who make up this truly unique program, and this includes all of the very talented students, staff, and researchers here at Georgia Tech as well as our incredibly supportive industry and state partners. The real credit for the success goes to all of the people who have been a part of the program over the past 40 years, and it was great to have so many of them here to celebrate with us today. I’m excited about continuing this tradition of excellence as we look to the future of the program,” said Doug Britton, ATRP program manager.

After remarks, attendees enjoyed an ice cream social and the debut of a new exhibit chronicling the program’s history of serving the poultry industry through innovative R&D. Earlier in the day, the program’s Poultry Advisory Committee held its annual meeting. Project directors provided committee members with an update on program research projects as well as technology transfer and outreach activities. A round-table session was also held where members provided feedback and discussed future research opportunities, challenges, and directions with researchers. The annual meeting serves as a critical step in ATRP’s efforts to identify and conduct research projects that best address the industry’s top priority needs, demonstrating that 40 years later, ATRP is still ready to answer industry’s call.

On April 23, GTRI’s Agricultural Technology Research Program celebrated 40 years of service to Georgia’s poultry industry. Pictured left to right: Doug Britton, ATRP program manager; Rusty Roberts, director of GTRI’s Aerospace, Transportation and Advanced Systems Laboratory; Bob McGrath, GTRI director; Gary Black, Georgia Commissioner of Agriculture; Abit Massey, president emeritus, Georgia Poultry Federation; Mike Giles, president, Georgia Poultry Federation; Craig Wyvill, retired ATRP director; and Gary McMurray, chief of GTRI’s Food Processing Technology Division.
The Poultry Plant of the Future

**A hallmark of the Agricultural Technology Research Program (ATRP) is its quest to drive transformational innovation in the poultry industry. Working with the University of Georgia’s Department of Poultry Science, ATRP has embarked on a research journey to define the next generation of poultry processing methods and technologies. ATRP Program Manager Doug Britton discusses the strategic initiative: “The Poultry Plant of the Future.”**

ATRP has joined the University of Georgia (UGA) in a strategic initiative, “The Poultry Plant of the Future.” This initiative is focused on envisioning what poultry production and processing should look like in 20, 30, or even 50 years. The concept stems from the fact that the practices of poultry production and processing have not changed fundamentally in the past 60 years. The consensus among researchers was that the time is right to reconsider these processes and to actively drive and evaluate new and different approaches to poultry processing.

Much of the technology used in today’s poultry processing is based on a system that has been in place since the 1950s. Current methods are a mixture of historical practices and labor-saving mechanization retrofitted with modern technologies. These retrofits were done in an attempt to meet more and more stringent sanitation, worker safety, and environmental regulatory demands. However, continuing to plug new technology into a 60-year-old system is not a viable long-term strategy for maintaining a thriving poultry processing system. At the same time, U.S. poultry production faces international competition to produce products in larger quantities at lower costs. There are also growing regulatory pressures to improve food safety and reduce overall environmental impact. Current methods will eventually reach a limit in their ability to address these growing demands/issues.

The goal of this strategic initiative is to develop innovative approaches for improving the overall performance and efficiency of poultry processing. The underlying drivers are shifting with increased focus on animal welfare, water consumption, waste minimization, sanitation, food safety, environmental impact, and worker safety. Using integrated systems-based approaches, researchers are seeking to address many of the challenges by looking across the entire production and processing chain (see diagram below).

Another key component and somewhat more challenging aspect of this strategic initiative is identifying funding opportunities to support the research, given the fiscal constraints at both the federal and state level. ATRP has begun to seed research activities that are aligned with this strategic effort with the anticipation that larger funding opportunities will eventually come. The need for transformational research in animal agriculture systems (and poultry, in particular) has been discussed with key federal and state government stakeholders. The national trade organizations and affiliated industry members also have played a crucial role in helping to build the case for targeted research focused on the future of poultry production and processing. Rapid adoption of technology has made the U.S. poultry industry an American success story. For the poultry industry to continue to be a global leader in protein production, it is imperative that the research to enable technological change be promoted and funded.

### Poultry Production & Processing of the Future

#### Issues/Drivers/Optimization Criteria

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The first and most important aspect of establishing a strategic initiative of this scope is to build a network of collaborators from a variety of disciplines with complementary areas of expertise. ATRP and UGA’s Department of Poultry Science researchers are building a network of potential collaborators with other universities and labs with targeted poultry-related research activities. Several one-day workshops have been held to lay the foundation for what we hope will become a multi-institutional center with research focused on the exploration of key technological and scientific challenges that face the poultry industry.

In addition, kernels of “out-of-the-box” research project ideas have begun to form through discussions among researchers from the various institutions. We strongly believe that it will be at the intersection between the traditional sciences and engineering where truly new and interesting approaches are developed. In order for this to occur, we must encourage and enable cross-disciplinary teams that can focus on specific common challenges. In the end, it will be the ideas generated and the results of the research that will determine the success of the effort.
EPA Issues New Guidelines for Water Reuse

BY JOHN PIERSON

Water reuse has been a goal of the poultry processing industry for many years. The Food Safety and Inspection Service (FSIS) established guidelines in 1999, where related performance standards for sanitation clearly require a supply of running water that complies with the National Primary Drinking Water regulations (40 CFR Part 141) for product contact. Interestingly, although the U.S. Environmental Protection Agency (EPA) enforces the national drinking water standards, water reuse regulations are administered on a state or local level. Thus, to encourage a more uniform approach, the EPA has recently updated its 1992 document, “Guidelines for Water Reuse” (Guidelines). The original document was published in 1980.

The update was issued as technologies have advanced, the field of application has broadened, and regulations are evolving. As a means of summarizing these activities, the Guidelines provide several case studies of projects that discuss the technologies, applications, and regulations. Agricultural irrigation of food and non-food crops is prominent, although industrial reuse for the food industry is included. The update draws heavily upon a recent National Academies Press book that examined water reuse with a particular focus on the potential for expanding the nation’s water supply through reuse of municipal wastewater.

From a broad perspective, water has evolved from a generally plentiful resource to a scarcer commodity as the core water infrastructure matured and stagnated while the population has continued to spread across the country and grow. As such, people developed areas that required water from other areas. One result of this historical phenomenon is that the need for water reuse continues to grow. In fact, the updated EPA guidelines note that “As technologies are now advanced enough to treat wastewater to the water quality required for the intended use, the concept of “fit for purpose” is highlighted to emphasize the efficiencies realized by designing reuse for specific end applications.”

Given the FSIS guidelines for product contact water, poultry processing and allied industries are examining new technologies with a direct focus on the concept of “fit for purpose.” Here, a critical aspect is highlighting the need for potable reuse technologies, applications, and regulations versus the broader notion of water reuse or reclamation (irrigation and agricultural purposes). Of particular importance in the updated guidelines and the National Academies Press book assessment is the distinction between indirect (IPR) and direct potable reuse (DPR). Indirect potable water reuse utilizes an environmental buffer between discharge and reuse while DPR does not.

Definitions used to establish the distinction between indirect (IPR) and direct potable reuse (DPR)

- **Indirect potable water reuse (IPR):** Augmentation of a drinking water source (surface or groundwater) with reclaimed IPR water followed by an environmental buffer that precedes normal drinking water
- **Direct potable water reuse (DPR):** The introduction of reclaimed water (with or without retention in an engineered DPR storage buffer) directly into a water treatment plant, either collocated or remote from the advanced wastewater treatment system

Those knowledgeable of processing effluents from full treatment systems designed to directly discharge are familiar with the water quality relative to streams or rivers where these waters are released. Here, primary (physical), secondary (chemical), and tertiary (biological, both traditional basins and membrane bioreactors) processes followed by ultraviolet light germicidal disinfection are commonplace. Beverage processors often also include reverse osmosis and/or ozonation. Yet, public perception of reclaimed effluents is still a major concern for the broader range of food manufacturers and processors. The growing consumer desire for demonstrated corporate social responsibility and sustainability is also fostering a discussion on the possibility of attaining energy and resource savings by treating high-quality effluent waters. Consequently, a key step is being taken at the municipal level to allow reuse of full-treatment process effluents. And the number of case studies is growing where municipalities are pilot-testing direct potable water reuse of reclaimed municipal wastewaters. However, this step is still only allowing that process effluents undergo treatment that complies with the National Primary Drinking Water regulations.

Thus, water conservation and non-product contact reuse (in keeping with the FSIS guidelines) remains the state-of-the-art for reuse in the poultry processing and other food industries. Regardless, keeping an eye on the successes of using reclaimed water in food crops may greatly advance the guidelines that shape closing the loop for water reuse. Innovative approaches that are pushing effluent quality standards are occurring, with a growing interest in membrane bioreactors. Georgia Tech engineers are working to provide better materials separations of various process streams. However, research is needed to better understand the protection provided by natural barriers relative to engineered processes.

John Pierson is a principal research engineer in the Georgia Tech Research Institute’s Food Processing Technology Division. His areas of expertise are wastewater pretreatment, alternatives, environmental control systems, pollution control, and biofuels. He leads the division’s environmental technical assistance program and can be contacted by email at john.pierson@gtri.gatech.edu.
Should You Move to the Cloud?

BY TUSHAR JAIWAL

Cloud computing today has become a popular buzzword. With new cloud computing services coming into existence every day, universities and businesses alike are contemplating if they should move to the cloud. There are several benefits of using cloud computing, which is why its use is becoming increasingly common. But, cloud services have a number of associated risks, especially for research institutions and companies. The production, transmission, or storage of proprietary data by cloud services could place the organization’s data at risk. It is imperative that these risks be considered before making a decision to use any cloud service.

Before we discuss the pros and cons of using cloud services, it is important to define the term “cloud services.” In an effort to formulate a Cloud Security Policy for the Georgia Institute of Technology, I participated on a panel that defined cloud services as “Hardware, software, or storage resources used without direct ownership of the underlying architecture that provide these services. Additionally, maintenance and physical access restrictions are non-enforceable or otherwise outside the ability of the user to perform or audit.” So, web services such as email clients (Gmail, Hotmail), document repositories (Google Docs, Dropbox), remote system access (PC Anywhere, Go To My PC), chat (Skype, Google talk), cloud computing platforms (Amazon Web Services, Microsoft Azure), etc., are all cloud services.

Cloud services offer several benefits, which make them an attractive option:

- **Ease of use:** Cloud services are kept ready to use by providers and as such are easy to use.
- **Low maintenance costs:** There is very little or no maintenance cost associated with the use of cloud services.
- **Flexibility and scalability:** The amount of resources needed can be easily scaled up or scaled down.
- **No up-front investment:** Cloud services are pay-per-use with no up-front investment.
- **Reduction in overall IT costs:** Cloud computing reduces both initial and ongoing IT labor costs.
- **Ability to develop and deploy applications faster:** Cloud computing lets you provision and make use of hundreds or even thousands of servers within minutes.
- **Ability to focus on your own projects:** Availing cloud services lets you focus on your core competency.

Although cloud services provide a host of benefits as discussed, their use entails several risks, too:

- **Reliability of the cloud service provider:** The use of cloud services of a startup puts data at high risk as the company may go out of business and the data may be lost.
- **Ownership of data:** Often the terms of service of cloud service providers state that they would own any stored data. This endangers any research, proprietary, or confidential data.
- **Changing the rules:** The terms of service of many cloud service providers contain a clause that asserts their right to change their terms of service without notice.
- **Level of support:** There are several risks associated with using cloud services with missing or limited level of support such as losing access to the data and the data getting leaked. The lack of any good support to address such issues poses a significant risk.
- **Validated provider:** Availing the services of a cloud service provider that has not undergone a security review or does not possess a certification (TRUSTe seal, European Union Safe Harbor certification, McAfee secure) poses a risk.
- **Meeting contractual obligations:** The contractual obligations of research institutions or businesses may prohibit them from sending the data to a third party such as a cloud service provider.
- **Jurisdictional issues:** The location of the cloud service provider’s data center may subject the data to different legal requirements. For example, if the data center is located overseas, it may allow a foreign government to access the data.

So, what should you do? Most importantly, you should ensure that the cloud service provider does not claim ownership of the data you create, store, and transmit with them. You should conduct regular audits of the cloud service provider to ascertain what assurance they provide, the level of support offered, and to ensure that their terms of service do not put your data at risk. The best way to approach this would be to see if your company or university maintains a cloud computing policy and to follow it. You should also contact your IT department, as this would not only help you avoid unnecessary risks, but they can help recommend the cloud service provider that best suits your needs. You should also try to use your organization’s cloud service offerings. Hopefully, you will be able to realize the benefits of cloud computing while avoiding the associated risks.

Tushar Jaiswal recently completed a graduate research assistantship in GTRI’s Food Processing Technology Division. He received a Master’s degree in Information Security from Georgia Tech on May 3, 2013.
A long-time goal of the Georgia Poultry Federation and poultry industry was achieved during the 2012 Georgia General Assembly session — the elimination of the sales tax on energy used in poultry processing. The tax change will make the Georgia poultry industry more competitive with processors in other states and throughout the world by saving the industry many millions of dollars annually.

**LONG ROAD**

A number of attempts to reduce or eliminate the sales tax on energy were made over the past decade, but in 2010, the Georgia legislature adopted HB 1405, which established the Special Council on Tax Reform. The mission of the council was to study the state’s revenue structure and make recommendations to the legislature the following year. The Federation and other business groups attended the council’s public hearings and made recommendations through testimony and written comments.

We were pleased when the Special Council recommended to the legislature the elimination of the sales tax on energy used in manufacturing, which would include poultry processing. The next step was to seek approval of this recommendation in the Georgia General Assembly. During the 2011 General Assembly, the tax reform legislation hit a snag in the late days of the session, and the bill had to wait until 2012 for further action.

**GOOD NEWS FOR POULTRY**

HB 386 was adopted by the House and Senate and signed by the Governor in 2012. The good news for poultry was that the agriculture section of the bill defined poultry processors as agricultural producers, which meant that 100 percent of the sales tax on energy would be eliminated beginning January 1, 2013, rather than a portion of the tax being eliminated in a phased-in period over four years as is the case for manufacturers. At the Federation’s suggestion, the bill also included a complete elimination of the sales tax on refrigerants used in poultry processing, such as CO₂, nitrogen, and ammonia. Energy used at feed mills also qualifies for the exemption. Energy includes electricity, natural gas, or other fuels.

**QUALIFYING FOR THE EXEMPTION**

In order to qualify for these new exemptions, a poultry company must obtain a Georgia Agriculture Tax Exemption Certificate (GATE) issued by the Georgia Department of Agriculture. Visit https://forms.agr.georgia.gov/GATE/ to apply or learn more about the GATE program. A company wishing to claim the exemption should provide a copy of its GATE certification to vendors providing the energy or other qualified purchases.

**FINALIZING THE RULE**

The Georgia Department of Revenue is required to write a rule implementing the law; however, the department has not finalized the rule even though poultry companies are currently eligible to claim the exemptions. This creates some uncertainty about which purchases are tax exempt and which are not, but it is clear that energy used in poultry processing and at feed mills is now exempt, along with refrigerants used in processing. We are also confident that machinery and equipment used at poultry processing facilities and feed mills are considered exempt. As a manufacturer, poultry processing machinery and equipment needed to be necessary and integral to the process in order to be exempt.

**WORKING WITH ATRP**

The Department of Revenue’s proposed rule includes a provision that would allow a poultry processor to claim all of the electricity used at a poultry processing plant as tax exempt as long as no more than 10 percent of the energy is used for a non-qualified purpose such as administrative office space.

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Mike Giles is president of the Georgia Poultry Federation.
The Agricultural Technology Research Program (ATRP) at the Georgia Tech Research Institute (GTRI) and U.S. Poultry & Egg Association (USPOULTRY) are excited to announce a new partnership for jointly hosting the National Safety Conference for the Poultry Industry, with additional support provided by the Georgia Poultry Federation, the National Chicken Council, and the National Turkey Federation — who, along with GTRI, were founding sponsors of the conference. This year’s conference will take place August 19-21, at the Omni Amelia Island Plantation on Amelia Island, Florida.

For the past 28 years, ATRP has served as the sole coordinator of this event. However, with USPOULTRY’s expansive offering of quality educational and technical seminars, it was an obvious fit for both organizations to partner together to maximize the effectiveness and reach of the National Safety Conference.

“ATRP has long had a strong working relationship with USPOULTRY, and it was only natural for us to partner together to provide the best possible programming for the only safety conference specifically for the poultry industry,” said Doug Britton, ATRP program manager.

The conference is designed specifically for poultry plant and corporate safety personnel, and it will continue as a three-day event with key presentations on important industry topics and updates on government policy. Other highlights include breakout sessions for discussing best practices and current challenges, as well as networking and knowledge exchange opportunities with other safety and health professionals. The technical content for the conference will continue to be guided by an advisory panel of industry safety and health representatives.

USPOULTRY will assume responsibility for managing the logistics of the conference, including the website information, on-line registration, and on-site arrangements. ATRP will continue to play an active role in working with the advisory committee to develop the content and select the topics and speakers for the conference.

The conference registration and hotel registration will open on June 24. Information on the conference can be found at www.uspoultry.org/educationprograms.
Technical Assistance Is Just a Phone Call Away

The Agricultural Technology Research Program (ATRP) provides no-cost technical assistance to Georgia-based firms and individuals in the poultry industry. These assist include simple inquiries regarding information or help needed to address a problem and extensive on-site consultations in which researchers collect data and provide a full report on their findings and recommendations. The technical assistance program also offers in-plant energy assessments designed to help companies identify strategies of reducing energy usage and costs. Recently, the program was extended to include workplace safety consultations, specifically those focused on ergonomics and cumulative trauma disorders. ATRP uses input from all assists to gauge situations calling for new research initiatives in energy, environmental, safety, and other areas.

To inquire about the program or to schedule an assist, call Doug Britton at 404-407-8829 or email doug.britton@gtri.gatech.edu.

Did You Know?

As Georgia’s most valuable agricultural sector, the poultry-egg industry has dramatically increased in size over several decades, with more than two-thirds of the state’s 159 counties now involved in production. Georgia has led the nation in broiler production for 28 consecutive years. Poultry-egg production and processing contributed $28 billion total economic impact for the state in 2011, and the industry contributes more than 111,500 jobs.

Source: 2013 Ag Snapshots: A brief focus on Georgia’s agricultural industry (based on 2011 Georgia Farm Gate Value Report by the Center for Agribusiness & Economic Development at the University of Georgia, published December 2012)