State Agriculture Department Prohibits Poultry Exhibits at Fairs & Shows

Poultry Entering State Must be Tested or Certified Healthy

Annapolis, MD (July 23, 2015) – To do everything possible to mitigate the risk of High Path Avian Influenza (HPAI) from infecting Maryland poultry flocks, the Maryland Department of Agriculture (MDA) will prohibit poultry exhibitions at all fairs and show after Aug. 25. MDA has also issued a quarantine order requiring all hatching eggs and poultry entering from out of state to be tested within 10 days or come from certified clean sources. This quarantine order will remain in effect until at least June 30, 2016.

“This strain of avian influenza could very well bring economic disaster to our largest agricultural sector if we don’t take steps to protect the birds now,” said Agriculture Secretary Joe Bartenfelder. “We have every reason to believe that HPAI will enter Maryland this fall, and we are making every effort to keep it out of our commercial chicken houses and backyard flocks. I strongly encourage all flock owners and managers to take this disease as seriously as they have ever taken anything and to practice enhanced biosecurity at all times.”

HPAI entered the Pacific Northwest of the United States in December 2014 and has been marching east ever since. It is carried by migratory waterfowl, such as ducks and geese, among others. To date, HPAI has been confirmed at 223 locations in 15 states and has impacted 48 million birds. The virus does not live in hot temperatures so incidents of HPAI have declined over the summer, but animal health experts expect cases to appear again during the fall migratory season, which starts in Maryland in early September.

HPAI is not known to threaten human health. It can, however, wipe out flocks of chickens in days. MDA encourages all flock owners of all sizes to exercise enhanced biosecurity measures and to be vigilant in ensuring others on their farms do so as well.

The prohibition on poultry exhibits will impact the Maryland State Fair as well as at least seven other major fairs scheduled after August 25. Many poultry exhibits will be replaced with poultry displays. MDA’s requirements for shows and fairs were revised in May. Those guidelines prohibited all waterfowl from being shown at fairs and shows, and required all poultry to be tested within ten days if they did not come from a clean or monitored flock.

Poultry auctions are not currently impacted by the order because MDA Animal Health officials are onsite at auctions, examining and testing birds. However, if HPAI is suspected in the region, poultry auctions will be closed down as well.

MDA has created a page on its website dedicated solely to HPAI information and news. It also contains information on biosecurity measures flock owners should take to protect their birds. See www.mda.maryland.gov/AvianFlu. Contact: Julie Oberg, 410-841-5888  Vanessa Orlando, 410-841-5889
As poultry growers you are well aware that the simple process of providing light to birds has become a little more complex during the last 20 years. Lighting programs have evolved into much more than just screwing in a light bulb and turning on a switch. So why have lighting programs become more detailed? Why do birds even need light?

When it comes to chickens there are three main functions of light. The first is to facilitate sight so that birds are able to navigate their environment. The second function is to stimulate the bird’s internal cycles due to changing hours of daylight. This allows the birds to synchronize essential physiological functions, such as body temperature and various metabolic steps that assist with feeding and digestion. The third function of light is to initiate hormone release for growth rate and sexual maturity. Lighting programs not only have an important role in bird health and performance, but they are also an important component of animal welfare guidelines and audit checklists.

In addition to the several benefits of light, darkness also plays an important role in bird health and performance. It has been reported that melatonin, a hormone produced by the pineal gland (a small gland located in the brain) and linked with the bird’s biological clock, may also be associated with immune function and disease resistance. Melatonin is produced by animals only during dark periods, and it has been reported that birds provided with sufficient dark periods have fewer health related problems compared to birds exposed to continuous light.

There are three important aspects of the lighting environment: light intensity, duration, and wavelength. Light intensity is measured in terms of foot-candles (light level at the working surface). A foot-candle is defined as the amount of illumination by a standard candle at a distance of one foot. The light output of a bulb is measured in lumens, and light intensity (foot-candles) is directly proportional to lumen output. For example, if you desire 1.0 foot-candle in your poultry house and you are getting 0.5 foot-candle near the sidewall with a 450 lumen bulb, you will need to install bulbs that produce at least 900 lumens.

Light meters can be used to measure light intensity in the poultry house. In order to obtain the most accurate measurement, it is important to measure light intensity at bird level and to angle the meter toward the nearest or brightest source of light. Typically growers are interested in making sure that all birds receive at least the minimum recommended level of light. Therefore it is recommended to measure light intensity near the side wall half way between light bulbs where it is the darkest. Researchers from the University of Georgia reported that a variation of 20% or less in light intensity should be expected with a properly installed lighting system. If you wish to maintain a
specific light intensity, it is recommended to use the lowest light intensity found in the house as the measurement. In fact once the specified light intensity is achieved, the dimmer can be marked to maintain that light intensity for future flocks. Although it is recommended to check light intensities a couple of times a year, since bulbs will become dirty overtime and can decrease the level of light they produce by 20% or more.

If you decide to purchase a light meter, it is important to buy a meter that can accurately measure light intensities below 0.1 foot-candles because most poultry companies recommend maintaining low light intensities in broiler houses (after brooding). Czarick and Fairchild recommend a light meter with a resolution of 0.01 foot-candles and have an accuracy of +/- 3%.

There are a wide variety of lighting programs available and many growers have asked the question: What is optimal light intensity to achieve optimal performance? Most research results have suggested that it is best to have a minimum of two foot-candles of light during the brooding period. When it comes to older birds however, optimal light intensity will depend on a number of factors such as breed, bird size, and number of hours of light each day. It is difficult to compare studies that report results of light intensity on performance because many of these studies use different breeds, raise birds to different ages and expose birds to different photoperiod lengths. You cannot compare “apples to apples” with these studies, and as a result discussion on this topic continues.

In addition to lighting schedule and light intensity, wavelength is also an important factor that influences bird performance. It has been reported that different colors have many different effects on behavior, growth, and reproduction. However, research results are inconsistent because of study differences in light source, light schedule, breed, and age of birds.

Another factor to consider as we enter into the summer months is the light that enters the house through the tunnel fans. When tunnel fans are in the sidewall, a limited number of birds may be exposed to high light levels. However, more birds are exposed to high levels of light when tunnel fans are in the end wall. This typically is not an issue with younger birds or when moderate to high light intensities are used. However, the behavior of older bird raised during the summer months may be influenced by the high intensity light entering through the end wall tunnel fans.

It is well documented that feed and water consumption are related. Typically water consumption will trend with feed consumption. As water consumption increases, feed consumption increases and vice versa. Additionally, most growers observe there are typical drinking and eating patterns for birds on lighting programs. The higher intensity light entering through the tunnel fans may influence water (and feed consumption). Czarick reported an example of this scenario at the 2014 National Meeting on Poultry Health, Processing and Live Production. Birds given a 5 hour dark period from 8 pm to 1 am did not respond with increasing water consumption when the lights came back on at 1 am, but instead responded to light from the morning sunrise. This suggests that the higher intensity light received from the tunnel fans prolonged the dark period perceived by the birds and thus altered their water consumption. This reduction in water intake can result in lower feed consumption, and may influence the weight of the birds at market age.

It is clear the lighting plays an important role in a broiler’s environment. However, there is more research needed in this area especially as new lighting technology emerges to address increasing energy costs, and more is learned how bird behavior is influenced by lighting programs.

A study at the University of Delaware shows that broiler performance in terms of breast and body weights was similar for two poultry-specific LED lamps and incandescent lamps and better than for CCFL.

Alternative lighting has the potential to reduce electrical consumption, but questions remain as to the impact on bird performance, according to E.R. Benson, R.L. Alphin, H. Li and C.J. Schmidt of the University of Delaware.

The goal of their project, sponsored by the US Poultry and Egg Association, was to study the impact of conventional and alternative lighting technologies on production growth parameters, organ weight and stress under controlled conditions.
In the initial proposal, incandescent, cathode fluorescent lamps (CFL), cold cathode fluorescent (CCFL) and one light-emitting diode (LED) technology were to be compared. However, after discussions with industry, this was altered to incandescent, CCFL and two agriculture-specific LED lamps.

The project had two objectives:

- to evaluate the impact of incandescent, cold cathode fluorescent (CCFL) and light-emitting diode (LED) on broiler performance during 42 day grow-outs, and
- to determine the interaction between lighting programs and lamp technology.

This study raised commercial broilers under one of four alternative lighting technologies with two replications per trial and four trials timed to balance across seasons. CCFL and incandescent lamps were used along with two poultry-specific LED lamps.

Bird numbers – approximately 84 per replication – were standardized to provide a balance between manageability and a large enough sample size to be significant. Selections of birds were euthanized and organ weights collected during necropsy at regular intervals.

The researchers found differences in performance between technologies.

Overall bodyweight was statistically similar for both LED lamps and incandescent but was lower for CCFL lamps. Lower body weight under CCFL lighting is consistent with field observations.

Controlled field trials with other LED lamps show lower bodyweight, which raises questions about the differences between different types of LED lamps, said Benson and colleagues.

In both laboratory and field trials, incandescent lamps tend to produce the highest bodyweight. There was a strong seasonal effect with the bodyweights.

No significant differences were observed for feed conversion, breast muscle weight or organ weights. Heterophil:lymphocyte ratio results show separation between some technologies, indicating potential differences in stress between technologies and/or lamps.

Based on the results of this study, CCFL lamps should not be used for broiler production, concluded the Newark-based researchers. They added that two types of LED lamps and incandescent lamps showed statistically similar body and breast weights.

Although not specifically measured in this study, Benson et al. (2013) documented the reduced energy consumption of LED lamps for poultry production. The two poultry-specific lamps tested in this study showed similar performance to incandescent lamps and can be expected to provide materially reduced energy consumption and warrant strong but careful consideration for production applications. *Article courtesy of thepoultrysite.com.*

Agriculture Law Education Initiative Publications

Delmarva Poultry Industry, Inc.’s **Timely Topics**

The University of Maryland’s Agriculture Law Education initiative has issued several fact sheets that provide information that could be helpful to chicken growers and other farmers. You can visit this website to read these publications. [http://www.umaglaw.org/publications-library.html](http://www.umaglaw.org/publications-library.html).

- Legal Liability of Seed Saving in an Era of Expiring Patents
- Using a Business Organization Structure to Limit Your Farm’s Liability
- When Can the Government Enter Your Farm?
Understanding Agricultural Liability: Livestock and Other Farm Animals

Choosing Your Will and Estate Planning Attorney

Estate Planning: Goals, Net Worth, and Final Instructions

Estate Planning: Owning and Transferring Property

Understanding Agricultural Liability: Maryland's Right-to- Farm Law

The Agriculture Law Education Initiative has an Infoline telephone number to direct callers to legal information resources related to their farms. The Infoline, (410) 706-7377, is answered by staff at the University of Maryland Francis King Carey School of Law. "A central goal of the Initiative is to assist in the preservation of family farms. The Infoline will help link family farmers with useful resources to further this goal," said law school associate dean Barbara Gontrum.

In 2011, the Maryland General Assembly gave the University System of Maryland a new assignment: preserve Maryland's family farms by helping their owners address the complicated legal issues associated with agricultural estates and trusts, regulatory compliance, and other agricultural law issues. The Agriculture Law Education Initiative is a collaboration under University of Maryland: MPowering the State. The Initiative combines the expertise and efforts of the Francis King Carey School of Law at the University of Maryland, Baltimore; the College of Agriculture and Natural Resources at the University of Maryland College Park; and the School of Agricultural and Natural Sciences at the University of Maryland Eastern Shore.

AVIAN INFLUENZA - How Will It Affect Me?

Jacquie Jacob, University of Kentucky

Avian influenza has hit the American egg and turkey industries hard in the last few months with over 45 million chickens and turkeys killed. Several backyard flocks have been affected, and consumer pocket books may be hit soon as well.

Avian influenza is caused by a very tricky virus and there are many different types known as strains. The different viruses are identified by their surface projections referred to as H and N. There are 16 different types of H’s and 9 types of N’s, making for a lot of possible combinations. To complicate things, even with the same H and N designation, the viruses can be classified as low path (LPAI) or high path (HPAI). The designation of LPAI or HPAI refers to the ability of the virus to kill birds. With the LPAI viruses the number of birds that die can be very low. In the case of HPAI types, however, mortality can reach 100% within a matter of days. The problem with the LPAI viruses is that they can easily change and become HPAI. The types of viruses of most concern are the H5’s and H7’s. We are currently dealing with H5N2, H5N8 and H5N1 HPAI strains.

The current HPAI outbreak was first detected in western Canada and later detected in northern Washington State in December of 2014. Since then it has been detected in 15 states and has affected 212 farms. Iowa and Minnesota turkey and egg farms have been hit the hardest.

The avian influenza virus is believed to have been brought in by migratory waterfowl (ducks and geese). Waterfowl can carry the virus without getting sick. They shed the virus in their manure, infecting other birds. The HPAI virus has been detected in three of the four North American Flyways – Pacific, Central and Mississippi. At the moment there is no effective vaccine available for HPAI.

Anyone keeping poultry flocks, especially those with waterfowl, needs to be concerned about HPAI. While the majority of the American flocks affected have come from commercial operations, several backyard flocks have been infected as well. Most of these had mixed flocks which included ducks or geese. If you are showing birds, you should be aware that several states, even some without cases of HPAI, have banned poultry shows. So check with your local county extension agent to see if your state has been effected.
To protect your flock: don’t attract wild birds by putting out bird feeders near your flocks; don’t introduce adult birds purchased from swap meets or flea markets; restrict access to your flocks; keep your work clothes and equipment clean; don’t borrow lawn and garden equipment tools or poultry supplies from other bird owners; and be on the alert for warning signs of avian influenza. The warning signs include sneezing, coughing, nasal discharge, watery or green diarrhea, and purple discoloration of the combs, wattles and legs.

When the migratory waterfowl begin in the fall there is a greater chance that avian influenza will be detected along all four flyways. Small flock owners should discourage migratory birds from roosting on their farms. Eliminate feed sources and discourage birds through sound devices. This fall will require producers to be very diligent about hunting and being in the woods so as to not track back the virus to their farms.

To date there is no evidence that the current HPAI viruses that are infecting poultry flocks in the U.S. can infect humans. While it is not believed that the virus is transmitted through poultry meat and eggs, no products from infected flocks are entering the human food chain.

The main effect will be on the price of eggs and turkeys. The HPAI has devastated the egg and turkey flocks and it will take many months for the infected facilities to come back into full production. The result may be a shortage of eggs and turkeys resulting in a major rise in the price of both. To date, meat chicken flocks have not been affected.

Nearly 300 persons attended three workshops this month for Delmarva chicken growers on making their farms less likely to have diseases.

Sponsored by the University of Delaware and University of Maryland, these meetings covered Avian Influenza Outbreaks in Commercial Poultry in America, Practical Biosecurity, Best Management Practices for Broiler Growers, and Avian Flu Response and Control Plan on Delmarva.

Are You An Animal Welfare Activist?

Jennifer Timmons, Asst. Professor, University of Maryland Eastern Shore

Are you an animal welfare activist? If you aren’t, you should be. Now I am not talking about animal rights, as there is a difference between the two philosophies. Animal welfare believes it is acceptable for humans to use animals for food, transportation, research, entertainment, companionship, etc., but we must do it in such a way to minimize suffering. Animal rights, on the other hand are based on the premise that humans should not exploit animals and they cannot be considered property.

The “Five Freedoms” are basic ideals of welfare for farm animals and were first proposed in the United Kingdom in the 1960s. These five freedoms are 1.) Freedom from thirst and hunger by free access to fresh water and feed to maintain health; 2.) Freedom from discomfort due to environment; 3.) Freedom from pain, injury, and disease by prevention or rapid diagnosis and treatment; 4.) Freedom to express normal behavior for the species; and 5.) Freedom from fear and distress. Right or wrong these ideals have been adopted by many animal welfare/rights groups as standards to measure current industry welfare practices. It is recognized that it is impossible to fully reach these standards in animal production. In fact, part of the world’s human population doesn’t enjoy these freedoms all of the time.

Unfortunately there are too many bad examples for animal rights on the news and internet. Many people have voted at the ballot box to change some management practices in animal agriculture in their state, but not with their
market dollar. One example of this is the 2008 California Proposition 2. This initiative requires that all farm animals “for all or the majority of any day” not be confined or tethered in a manner that prevents an animal from lying down, standing up, turning around or extending its limbs without touching another animal or an enclosure such as a cage or stall. As a result, conventional cage housing systems used in the egg industry must be modified by the year 2015 to meet the new requirement. This regulation bears penalties against egg producers and their employees of up to $1,000 and/or a jail sentence of up to six months per violation.

This new regulation will increase the cost of production and puts California egg producers at a competitive disadvantage with egg farms in other states. As a result, the state legislature passed a measure in 2010 to require out-of-state producers to comply with California rules. Missouri’s attorney general has filed a lawsuit with the state of California stating that this legislation violates the constitution’s Commerce Clause.

The Poultry Science Association has reviewed the initiative and found there is no credible scientific basis to support the space requirement for laying hens detailed in Proposition 2. This initiative will ban newer housing systems that research has shown to have positive impacts on hen health and behavior. Similar animal care regulations have been initiated in Arizona, Colorado, Florida and Maine.

In Ohio, voters have taken another approach. Voters approved the creation of a Livestock Care Standards Board. This initiative places livestock and poultry welfare under the authorities of the state based on standards determined by Ohio farmers, food safety specialists, veterinarians, consumers and county humane societies.

There has been a loss of consumer confidence and individuals involved in animal agriculture must be more vigilant than animal rights activist to regain creditability with consumers. The National Chicken Council has established animal welfare guidelines and an audit checklist to assure the humane treatment of animals and to promote the production of quality products. Audits provide a picture in time of how a company or individual manages their animal welfare system. The Professional Animal Auditor Certification Organization, Inc. (PAACO) promotes the humane treatment of animals through education and certification of animal auditors (http://www.animalauditor.org/). PAACO certifies audits using science-based minimum requirements.

No management system is perfect that accounts for all animal behavioral, physiological and other needs. However, some animal rights groups want the consumer to believe that this perfection exists and it is only because of bad intentions on the part of the producer that these are not being practiced. The question remains, is society willing to pay for higher costs of greater levels of perfection in animal welfare, or just demand changes through regulations? We must demonstrate and educate the consumer about production agriculture so they understand their food is produced in a safe and humane manner. It is important we communicate to consumers that we share their values regarding the care of farm animals. Individuals working in animal agriculture must accept zero tolerance for inhumane care of an animal and always demonstrate competence for humane animal care.

It is important to understand that noncompliance with good animal welfare practices is as great a threat to business as any traditional feed cost or animal health problem. Therefore I will end this article the same way I started. Are you an animal welfare activist? If you aren’t, you should be.

Developing a Biosecurity Plan for Employees
Sarah Everhart, University of Maryland Francis King Carey School of Law

Biosecurity is a set of proactive measures designed to prevent the spread of disease on in poultry and livestock. There are three major components to any biosecurity plan: traffic control, sanitation, and isolation. While many farmers create a biosecurity plan for farm visitors, it is also advisable for agricultural employers to create a biosecurity plan for employees. Given the importance of biosecurity measures, an agricultural employer may want to consider making compliance with a farm’s biosecurity plan a key provision of any employment contract and/or relationship.
Employee biosecurity plans should contain clear directives to help prevent the spread of pathogens through foot and vehicle traffic. At a minimum, a plan should address how employees are to prevent the spread of diseases from shoes and clothing. For example, an employer should spell out whether employees will have a pair of shoes and a set of overalls, stored at the farm, to wear only when working around poultry or livestock. Given the current threat of avian influenza, it may also be advisable for an employer to prohibit an employee from wearing his or her boots and overalls outside of the poultry or livestock barn and providing an adequate storage area for employees to store their boots and overalls near the entry of the barn. An employee biosecurity plan should also include a provision disallowing visitors to the farm, unrelated to the farming operation, who may carry pathogens and spread disease onto the property.

An employee biosecurity plan should also have standards for sanitation such as hand washing rules. In addition to establishing hand washing standards, the employer should ensure that work areas are equipped with adequate hand washing facilities for employee use. The plan should include information on how employees are to clean and maintain livestock cages, poultry areas, food/water containers, and tools used around poultry and livestock. To prevent the spread of disease, employees should be properly warned against the danger of sharing tools and supplies with other farmers, and employees should be prevented from borrowing farm equipment for personal use without properly cleaning the equipment before returning it to the operation.

An employee biosecurity plan may include restrictions on after-hours activities which can pose a risk to poultry or livestock. One example would be restrictions on employees coming into contact with off-farm animals at livestock demonstrations or other places where off-farm livestock are present, such as the feed store and fairs. The plan should also inform employees how to prevent disease from entering the farm through vehicles such restricted driving areas and methods of disinfecting vehicles upon reentry such as the required washing of vehicle tires, if they have driven in an area where off-farm animals are present. Further, employers may want to establish a parking area a fair distance from poultry and livestock to prevent the spread of pathogens.

Finally, employees should know the warning signs of infections in poultry and livestock because early detection is very important to prevent the spread of disease. Employers need to make sure their employees are well educated on the warning signs of infections in poultry and livestock and provide employees the opportunity to attend education classes on the topic. Upon noticing signs of infection in the poultry and livestock, employees should be instructed to immediately inform their employer and the farm veterinarian. Contract growers will also need to alert their service technician as quickly as possible.

How can an agricultural employer make compliance with a biosecurity plan a condition of employment? An employer should put an employee biosecurity plan in writing, distribute a copy to each employee and allow employees an opportunity to read the plan and ask questions about the plan during working hours. Regardless of whether an employee has a written contract, it is a good idea for an employer to keep a short signed acknowledgment from each employee that he or she has received the biosecurity plan and understands its terms. If an employer has a written employment contract with an employee, the contract should state that the employee has had an opportunity to read the biosecurity plan, understands it, and that failure to comply with the plan is grounds for termination. An employer who does not have a written employment contract with an employee should clearly explain the consequences to the employee if he or she fails to act in accordance with the plan. To encourage compliance, an employer should set a good example of proper adherence to the biosecurity plan. If an employer doesn’t follow the practices outlined in the biosecurity plan, it is unlikely employees will follow the measures.

Biosecurity measures are constantly changing as new diseases and prevention methods emerge, so it is important for employers to assess and adjust their biosecurity practices and plans periodically. An employee biosecurity plan should include language that the plan is subject to change at the discretion of the employer and compliance with the plan, if amended, is a condition of continued employment.

This post contains very general concepts on biosecurity plans for employees. Any employee biosecurity plan should be carefully tailored to the specific type of poultry or livestock cared for and the individual operation. The University of Maryland Agricultural Extension can help farmers create appropriate biosecurity plans for their operations and any farmer with questions should contact their local extension office for assistance. Additionally, a good source of information on poultry biosecurity can be found at: http://extension.umd.edu/poultry/commercial-poultry-production/biosecurity-protects-your-birds.

Editor’s Note: Sarah Everhart is a legal specialist with the University Of Maryland Francis King Carey School Of Law. This article is not a substitute for the advice of an attorney and should not be viewed as legal advice.
How many of you remember the Dr. Seuss book “Oh, the thinks you can think!”? Like most of Dr. Seuss’s books, it uses many off the wall examples to illustrate the endless possibilities of things or ideas to think about. As a mom to young children, this is how I view smartphones. No matter where you are or what you are doing you can research any useful or useless fact you want using your smartphone. If you are like me, you probably use your smartphone for both useful and useless information.

So what is a smartphone? Smartphones are cellular telephones with more advanced computing capability than single purpose cellular phones. Commonly used smartphones include the iPhone, Android and BlackBerry. According to a recent report published in January 2014 by the Pew Research Internet Project, 90 percent of adults in the United States have a cell phone of some kind. The survey also reports that 58 percent of all American adults own a smartphone.

Practically every profession in the United States has adopted the use of smartphones to enhance their business. The agriculture industry is no different. Smartphones, with the addition of agriculture related apps, have become one of the most useful pieces of equipment on many farms today. The abbreviation “app” is short for application software written for mobile devices such as smartphones and tablet computers. These software and internet applications provide the user with the ability to perform a variety of functions using a smartphone. Smartphone applications fall into four basic categories: news applications to access information on current events, data logging and management for recordkeeping, calculators, and social media.

According to a WATT-Rennier Poultry Confidence Index poll in 2011, 68 percent of respondents from the poultry industry use a smartphone.

There are hundreds of mobile apps available for agriculture. When I searched apps for agriculture on my iPhone there were 575 options available. According to most articles I read, some of the most commonly used apps accessed by farmers are weather and market apps.

The best way to determine which apps will be useful for you is to browse the app store using appropriate keywords like fertilizer, or manure calculator. The Texas A & M extension service has put together an extensive list of apps for agriculture that may be useful (http://aged.illinois.edu/sites/aged.illinois.edu/files/resources/Apps-for-Ag-Revised.pdf). As I was researching this topic, I also came across some good apps. Some of these include Extreme Beans and Purdue Pest ID. One app that I found particularly interesting since I continue to promote agriculture to young people as a career is Farming Simulator 14. This realistic game allows the user to manage his/her own virtual farming operation.

The University of Nebraska extension service has developed an app for manure management. The manure calculator app allows farmers to measure the amount of manure spread, calculate its nutrient content and also estimate the amount of money saved by using manure over traditional chemical fertilizers. The manure monitor app is designed to assist livestock and poultry farms in keeping records related to environmental stewardship.

A minimum ventilation calculator for broiler houses is also available for smartphones from Auburn University. (http://www.aces.edu/dept/poultryventilation/index.php). In addition, there are several apps available for the small flock owners to help choose breeds and manage a flock.

Researchers at the University of Georgia have used a wind meter designed to work with some smartphones. The small vane anemometer plugs into the headphone jack and works along with a free app to measure wind speed in tunnel ventilated poultry houses. There are also apps available to access and monitor the conditions in a poultry house from your smartphone.

Although it is apparent that the majority of Americans utilize smartphones to enhance their daily lives, not everyone uses or likes smartphone technology. This may be due to poor cell phone reception or they simply think it is a waste of time. No matter your opinion about smartphone technology, apps are an additional tool that farmers can use to help manage and improve the productivity of their operation.