TN POULTRY NEWSLETTER

WINTER ISSUE - DECEMBER 2023

Tennessee Poultry Association

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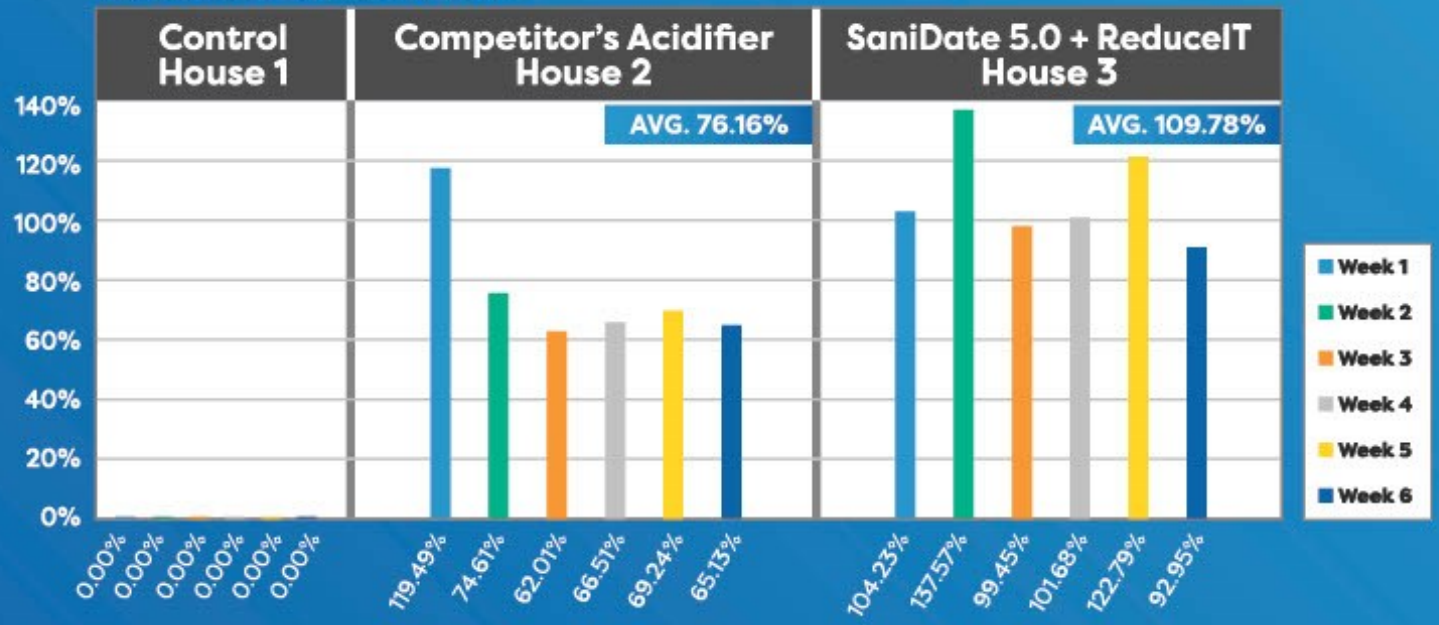
Advertising Index

Reduce pH, Increase Success

BioSafe Systems conducted a farm trial in the fall of 2021 to compare the weekly average water consumption between the control house (house 1), the competitor's acidified product (house 2), and SaniDate® 5.0 + ReduceIT™ (house 3). Products ran from placement of baby chicks through catch. House 3 drank 109% more than house 1, and 33% more than competitor's acidified product.

%Δ Water Consumption



Keep water clean and clear, provide greater antimicrobial control, and promote a healthy gut flora. Use SaniDate 5.0 + ReduceIT to quickly lower drinking water pH, prevent scale buildup, bacteria growth, and algae in water lines.

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1. Vaddu S, Kataria J, Rama E.N., Moller A.E., Gouru A, Singh M, Thippareddi H. Impact of pH on efficacy of peroxyacetic acid against Salmonella, Campylobacter, and Escherichia coli on chicken wings, Poultry Science, Volume 100, Issue 1, Pages 256-262, ISSN 0032-5791, 2021

BioSafe Systems

1-888-273-3088 | BioSafeSystems.com

News from around the complexes

Aviagen® announces the grand opening of its new pedigree farm in Crossville, Tenn., which took place on Nov. 16. There to welcome guests were Aviagen CEO Jan Henriksen, De Wet Nortje, general manager of Higher Generation Production, and Andy Goldman, vice president of Pedigree Operations.

Kasey Guthrie has started a new position as Microbiologist with **Aviagen**. She has a BS in Poultry Science from Auburn and was previously an Animal Welfare Specialist. Kasey was also honored as a 2023 TPA NextGen Young Leader in August.

Allied member news

A sales collaboration has been announced between two industry leaders, **Southwestern Sales Co**. and **Space-Ray**. The two respected companies are embarking on a joint sales effort that promises to streamline how they deliver exceptional products and services to their valued customers.

Clear Comfort unveiled the CCW3200, a revolutionary all-in-one livestock drinking water treatment solution that's powered by the industry-leading patented Hydroxyl-Based Advanced Oxidation Process (AOP) sanitation. Built for biosecurity protection, the CCW3200 elevates animal health, growth and production of meat protein, dairy and eggs. Formerly known as Silver Bullet Water Treatment, Clear Comfort leveraged its longstanding livestock expertise and patented AOP technology to deliver the ultimate in return on investment for growers and integrators. ***Clearcomfort.com***

Mike Lopez has recently joined the team at **QC Supply** as Key Account Manager. He is based out of the South Fulton store and has 13 years experience in the poultry supply business.

Dale Barnett is the new Vice President Business Development at **Johnson Energy Solutions**. JES brings together teams to design, build, operate, and maintain renewable energy projects with a current focus on converting poultry litter into natural gas.

DATES TO REMEMBER

REAP GRANT DEADLINE
DEC. 31, 2023
See pages 51-52 for more information.
USDA.GOV

IPPE
Atlanta, GA
JAN. 30 - FEB. 1, 2024
See page 6 for grower discount coupon.
INTERNATIONAL PRODUCTION AND PROCESSING EXPO

TPA LIVE PRODUCTION WORKSHOP
APRIL 24, 2024
FARM BUREAU EXPO CENTER
Lebanon, TN

TPA SCHOLARSHIP FUNDRAISER
Golf Scramble
MAY 21, 2024
HERMITAGE GOLF COURSE
Old Hickory, TN

TPA SCHOLARSHIP FUNDRAISER
Sporting Clays
MAY 22, 2024
CROSS CREEK CLAYS
Palmyra, TN

TPA ANNUAL MEETING & SUMMER GETAWAY
AUG. 9-10, 2024
GAYLORD OPRYLAND RESORT AND CONVENTION CENTER
Nashville, TN

Cobb proving grounds to deliver unprecedented genetic predictability, marks a new era for broiler product development

October 30, 2023, at ***PoultryProducer.com*** *by Jim*

Cobb is revolutionizing how it develops and brings broiler breeder products to market using scale and technology to yield comprehensive, accurate performance data. ***Click here for full article***

WELCOME NEW ALLIED MEMBERS

Clear Comfort
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303-657-2405

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Landon Cason
615-237-1737

Southern Solar Systems
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Poultry political news in Tennessee

December 2023, Submitted by Nathan H. Ridley

Calm Before Session As the January regular session and the holidays approach, the pace of state government slows a bit. While interest groups and legislators may well be working on the drafting of legislation, for many, work is not top of mind. The second regular annual session of the 113th General Assembly will convene at noon on Tuesday, January 9, 2024. Bills that were not disposed of during the 2023 session may still be handled. The 2024 session will get off to a faster start than last year, because the work of the 2023 organizational session with the committee and staff assignments from 2023 carrying forward into 2024. Speaking of committees, the primary committees of jurisdiction for poultry issues are the House Agriculture & Natural Resources Committee chaired by Chris Todd of Humboldt and the Senate Energy, Agriculture & Natural Resources Committee chaired by Steve Southerland of Morristown. Governor Lee will probably make his State of the State and Budget Address on Monday, February 5, 2024. With Governor Lee's announcement that he will propose private school vouchers on a statewide basis, that single issue is expected to dominate the 2024 legislative session.

State Revenue Forecast This topic falls into the boring, but important category. Forecasting how much tax revenue Tennessee will collect in a fiscal year is an important part of sticking to a balanced budget. Since 2018, Tennessee has enjoyed significant and steady increases in sales tax revenues because of the addition of internet sales to the state's tax base. State sales tax revenues continued to be strong in the first quarter of the fiscal year and exceeded projections by $74 million. Business taxes, on the other hand, missed projections by $61.4 million. So, the state is still ahead of projections, but just barely. With wars and rumors of wars in the news daily and prospects of a federal government shutdown in January, one must be alert to the prospects of an economic downturn caused by an external event, and its effect on state revenues. The state's Funding Board tends to agree and has approved a revised range of general fund revenue projections at between -0.5% to 0% in the current budget year, and a range of -0.5% to +0.5% for the fiscal year beginning July 1, 2024.

Waters of the United States or WOTUS The Lee Administration is also expected to bring forward legislation in 2024 that will bring state law into parallel with the recent U.S. Supreme Court decision in Sackett v. EPA, decided on May 23, 2023. In that case the U.S. Supreme Court disagreed with an EPA permitting decision involving Michael and Chantell Sacket for a lot near Priest Lake in Bonner County, Idaho. The Sackett's were backfilling their 0.63-acre lot with sand and gravel for a house when they received a compliance letter from the EPA because their property contained protected wetlands. Turns out, the Sackett's property was across a 30-foot road from an unnamed tributary that fed into a non-navigable creek. The Supreme Court ruled in favor of the Sackett's in a 9-0 decision. The EPA and the Corps of Engineers have revised their rules with a conforming final rule with publication in the Federal Register on September 8, 2023. That rulemaking process is now subject to litigation as plaintiffs including several states are arguing that the updated WOTUS rule fails to comply with the Supreme Court's ruling in the Sackett decision.

Calendar Notes:

December 22 and 25 – Christmas holidays for state offices
December 29 and January 1 – New Year's Day holidays for state offices
January 15 – Martin Luther King, Jr. holiday for state offices
February 5 – Governor Lee's State of the State address
February 19 – Presidents' Day holiday for state offices

Nathan Ridley is an attorney with the Nashville office of Bradley Arant Boult Cummings, LLP. You may contact him by e-mail at nridley@bradley.com.

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Jeff & Lisa Clements

EXPERIENCE

THE POULTRYSOUTH TEAM DIFFERENCE

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- SELLER IN ALABAMA

"They helped me out so much. Due to our situation they went above and beyond what they had to do to help me get the farm closed. Robert was so compassionate and helpful to make sure that everything went well and got it to the closing table. They proved to me that good people do still exist in this world!"

- SELLER IN TENNESSEE

"The PoultrySouth Team did exceptional selling my farm. Took care of everything. They did a great job...I didn't have to do the leg work or anything. They came to me and took care of everything!"

- SELLER IN GEORGIA

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Meet Jeremy Martin – TPA President

We are excited to introduce Jeremy Martin, Regional Business Manager for Aviagen®, as our new TPA President. Jeremy stepped into this role at our annual meeting in August. He has served on our Board of Directors since 2019 and the Executive Committee since 2021. He also chairs our Scholarship Committee and was recognized with the Workhorse of the Year award in 2022.

Jeremy's Journey

Jeremy hails from the rural Alabama community of Boaz. After high school, like many of his peers, he found himself at a crossroads, unsure of his career path.

For Jeremy, Auburn University was the logical choice. "I knew I wanted to be in agriculture – I wanted to work outside and work with my hands." After a meeting with the Dean of Agriculture at Auburn, Jeremy was advised to major in Poultry Science mainly based on the fact that he had some experience working part-time at a local chicken house during high school. Poultry, being the largest industry in the state, was thus a natural fit.

Upon graduation, Jeremy interviewed with the head of live production at Ross® Breeders, now Aviagen, and thus started (up to this point) 26 years of dedicated service.

Since then, Jeremy's career has seen steady growth within Aviagen. He started as a Grandparent (GP) Hen Supervisor in Elkmont, Alabama, and steadily climbed the ranks, taking on roles such as Great Grandparent (GGP) Supervisor, Pedigree Supervisor, GP Breeder Manager, Director of GGP Operations, Director of Quality Assurance, US Sales Manager, and his current position as Regional Business Manager. He has contributed his skills and expertise to Aviagen's facilities in Elkmont and Crossville, Tennessee, as well as the corporate office in Huntsville, Alabama, where he is now based.

Jeremy currently resides in Athens, AL with his lovely wife of over 20 years, Lori. Their son, Charlie, is 19 years old and a freshman at Auburn, majoring in pre-law. Their daughter, Mae, is 17 years old and a junior at Athens High School. Mae is on her high school swim and tennis teams.

When asked how he likes to spend his time when he is away from work he replied – "Hanging out with my family, running, hiking, and Auburn football."

When asked what he would like people to know about him – "Follower of Christ, husband, father, son, brother, and friend to some awesome people!"

Jeremy's Inspiration: The People

When asked what motivates him each day, Jeremy's answer is straightforward – the people. He finds inspiration in the remarkable individuals he works with, both within Aviagen and among the customers he serves. From frontline workers to leadership, Jeremy very much enjoys the high-quality, hardworking, and family-oriented individuals in the poultry industry.

Leadership With a Vision: Advocating for Our Members and Inspiring the Next Generation

As our President, Jeremy will be responsible for leading the organization alongside Tracy Rafferty and collaborating with the Board of Directors to chart our future course. He brings a clear vision to the new role. His vision revolves around representing the best interests of growers, integrators, genetics companies, and allied poultry members in the state of Tennessee at the legislative level, bridging the gap between legislative decisions and our valued members.

Another one of Jeremy's top priorities is "growing the next generation of leaders." This includes offering scholarships to deserving students pursuing careers in the poultry industry and students who are children of our Tennessee poultry producers. It is very important to identify and invest in the next generation of leaders to carry on and continue to grow and strengthen the industry.

Jeremy is actively involved in outreach efforts, engaging with university Poultry Science departments and participating in Future Farmers of America activities across schools in the southeast.

The Netherlands begins field trial on avian flu vaccination

September 19, 2023, at Feedstuffs.com by Krissa Welshans

Never before have chickens in the Netherlands been vaccinated against avian flu in a field trial, but that is no longer the case as 1,800 day-old chicks recently received a vaccination against highly pathogenic avian influenza (HPAI) H5N1. This marks the start of a field trial, which is taking place on behalf of the Ministry of Agriculture, Nature and Food Quality (LNV). It is an important step toward large-scale vaccination of poultry against the virus. ***Click here for full article***

Suarez: Vaccination needs to be explored as HPAI becomes more widespread, infectious

October 6, 2023, at ModernPoultry.media

Reality is sinking in. Highly pathogenic avian influenza (HPAI) in the US is likely here to stay, and vaccination may be an option for long-term control, reported David Suarez, DVM, PhD, US National Poultry Research Center. ***Click here for full article***

Would an NAE-style model work with HPAI vaccination?

October 17, 2023, at WattAgNet.com by Roy Graber

Not all countries will be quick to accept vaccinated poultry, so separating vaccinated flocks from unvaccinated flocks might be an option. ***Click here for full article***

Poultry scientists test promising avian flu vaccination strategies

November 6, 2023, at ModernPoultry.media

Avian influenza outbreaks in the US are rare but, when the virus strikes, the results are devastating. The disease spreads rapidly, forcing producers to rely on quarantine-and-cull to limit the damage. A 2015 outbreak in the US led to an estimated loss of more than 48 million birds. ***Click here for full article***

Creating resistance to avian influenza infection through genome editing of the ANP32 gene family

October 10, 2023, at Nature.com by Wendy S. Barclay and Mike J. McGrew

Chickens genetically resistant to avian influenza could prevent future outbreaks. In chickens, influenza A virus (IAV) relies on host protein ANP32A. Here we use CRISPR/Cas9 to generate homozygous gene edited (GE) chickens containing two ANP32A amino acid substitutions that prevent viral polymerase interaction. After IAV challenge, 9/10 edited chickens remain uninfected. Challenge with a higher dose, however, led to breakthrough infections. Breakthrough IAV virus contained IAV polymerase gene mutations that conferred adaptation to the edited chicken ANP32A. Unexpectedly, this virus also replicated in chicken embryos edited to remove the entire ANP32A gene and instead co-opted alternative ANP32 protein family members, chicken ANP32B and ANP32E. Additional genome editing for removal of ANP32B and ANP32E eliminated all viral growth in chicken cells. Our data illustrate a first proof of concept step to generate IAV-resistant chickens and show that multiple genetic modifications will be required to curtail viral escape. ***Click here for full article***

CRISPR makes chickens more resistant to avian influenza

October 11, 2023, at WattAgNet.com by Elizabeth Doughman

Altering a small section of chicken DNA improved resistance to avian influenza with no negative impacts on health or well-being, revealed new research from the University of Edinburgh, Imperial College London and Pirbright Institute. ***Click here for full article***

Scientists claim gene editing breakthrough in bird flu fight

October 13, 2023, at PoultryWorld.net by Tony McDougal

Scientists have found that alterations to a key gene linked with avian influenza infection can offer partial protection, signaling a path to flu-resistant poultry. ***Click here for full article***

HPAI returns to commercial poultry farms in the US - Time for a new approach?

October 13, 2023, at Egg-News.com by Simon M. Shane

Until October 4th, commercial farms in the U. S. were free of highly pathogenic avian influenza (HPAI) since April 2023, in the case of turkeys and December 2022 for broiler farms and egg production complexes. In the interim, there have been numerous cases of HPAI and isolation of H5N1 virus in backyard farms and from migratory waterfowl now undergoing their southward migration. In September, there were 32 isolations from either marine birds or waterfowl in the states of Alaska, Connecticut, Virginia, Iowa, Pennsylvania and Mississippi. These states encompass the Pacific, Mississippi and Atlantic Flyways. The current situation is eerily reminiscent of events preceding the 2022 epornitic. Europe is contending with persistence of H5N1 in wild birds with infection of backyard and commercial flocks following a pattern established over the past three years since the emergence of the panornitic H5N1 strain designated clade 2.3.4.4b. ***Click here for full article***

Beware of quick fixes for HPAI

November 17, 2023, at Egg-News.com by Simon M. Shane

As HPAI resurfaces in the Canadian and U.S. poultry industries, we can expect spurious and unsubstantiated claims for disinfectants, air purification and other measures to protect flocks. A recent presentation by a poultry farmer in Canada was widely circulated creating a misplaced anticipation of protection. The promoters claim that hydroxyl free-radicals generated by UV radiation will destroy HPAI. This is a valid assertion under laboratory or restricted and controlled conditions. The challenges inhibiting destruction of influenza virus within a building housing a large flock relate to volume of air movement, the quantum of virus and environmental conditions including suspended dust within a poultry house. ***Click here for full article***

The do's and don'ts of better poultry disease outcomes

September 18, 2023, at WattAgNet.com by Elizabeth Doughman

How operators prepare for and react to a poultry disease outbreak can dramatically affect the outcome. ***Click here for full article***

Spotlight on economic and public health impacts of bird flu

September 21, 2023, at PoultryWorld.net by Tony McDougal

Knock-on effects from the global avian flu crisis are beginning to have significant effects on multinational poultry companies as they struggle to meet demand. *Click here for full article*

How the current avian influenza strain evolved to be so deadly

October 19, 2023, at CanadianPoultryMag.com by Nature

Genetic changes to avian influenza viruses have led to spread among many wild species, creating an uncontrollable global outbreak. Researchers studying the evolution of the bird flu virus over the past 18 years have shown how the strain currently circulating worldwide, an extremely deadly form of the H5N1 subtype, has become increasingly infectious to wild birds. *Click here for full article*

UK study finds some seabirds developing avian influenza immunity

October 23, 2023, at the PoultrySite.com by Global Ag Media

As part of a major research consortium announced last June, the U.K.'s top scientists have discovered that some seabirds are demonstrating immunity to avian influenza, according to a news report from the British Free Range Egg Producers Association (BFREPA). The eight-strong FluMap consortium, headed by the world-leading research team at the Animal Plant Health Agency (APHA), has developed laboratory tools that can dissect the immune response in birds that have been exposed to avian influenza viruses in their lifetime. *Click here for full article*

Seabirds with AI immunity could offer antibody insight

October 24, 2023, at WattAgNet.com by Mark Clements

Birds from the world's largest gannet community could offer clues to how antibodies respond to avian influenza infection. *Click here for full article*

Agricultural exemption holders must verify information to renew

NASHVILLE – The Department of Revenue reminds agricultural exemption holders that they must verify their exemption with department by December 31, 2023, to keep buying certain agricultural items tax-free.

Agricultural certificates of exemption allow holders to buy certain agricultural items used primarily in agricultural operations, such as fertilizer and farming equipment, without paying sales tax. These exemptions expire every fourth year, and certificates for the current period expire December 31, 2023.

Exemption card holders can renew their cards online by following these directions, or by contacting the department at 615-253-0600 or revenue.support@tn.gov. Exemption holders should have also received a letter in the mail with instructions on how to renew their cards. "We recognize the importance of agriculture in Tennessee, and we're happy to provide this tax relief," Revenue Commissioner David Gerregano said. "We want to make this process as easy as possible for exemption holders, while also keeping our own records up to date."

For more information about the agricultural tax exemption, visit Revenue's website. Currently, there are roughly 110,000 agricultural certificate of exemption holders in Tennessee.

Special discount offered to poultry growers to attend IPPE 2024

Poultry growers are invited to attend the 2024 ***International Production & Processing Expo*** (IPPE) with a special registration fee of only $5 (onsite only), an excellent savings of $125! This program is open to U.S. residents only. *See coupon below.*

Young farmer makes history, uses video games and YouTube to buy $1.8M land

November 25, 2023, at AgWeb.com by Chris Bennett

After a year-long wait, Grant Hilbert and his company, SquadBuilt, released American Farming on Nov. 24. Here's a look back at his journey to become a gamer, social media influencer and farmer. ***Click here for full article***

Hofacre: Why on-farm control is needed for Campylobacter in broilers

June 14, 2023, at ModernPoultry.media

On-farm research reveals a tough road ahead for broiler farms trying to reduce levels of Campylobacter jejuni, the major cause of bacterial foodborne illness in humans in the US, according to the Centers for Disease Control (CDC). *Click here for full article*

Achieving success with coccidiosis vaccination in antibiotic-free systems

June 16, 2023, at ModernPoultry.media by TJ Gaydos, DVM, MAM, DACPV

The transition to no antibiotics ever (NAE) production has increased reliance on vaccines for managing coccidiosis, but successful coccidiosis vaccination requires careful attention to management details that can easily be overlooked. *Click here for full article*

New challenges in coccidiosis control

October 19, 2023, at PoultryProducer.com by Jim

Coccidiosis has always had a huge economic impact on the commercial poultry industry, sharply reducing productivity and profits, and producers rely on effective — and cost-effective — solutions to prevent and treat it. In the past, synthetic anticoccidial drugs and antibiotics, including ionophores, were the primary preventative measure in commercial poultry rearing practices. Today, with increasing demands for antibiotic-free and sustainably raised meat, producers are looking for new options to manage coccidiosis and the secondary bacterial infections that often result from it. *Click here for full article*

Study: Bacteria genetically modify to escape effects of vaccination in pigs and poultry

October 4, 2023, at ThePoultrySite.com by ETH Zurich

Researchers at ETH Zurich and the University of Basel have developed a vaccine that protects animals from Salmonella. These bacteria often escape the effects of vaccination by genetically modifying their protective coat. The researchers have succeeded in manipulating this process to lure the bacteria into an evolutionary trap. *Click here for full article*

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Why is chicken the no. 1 protein? We asked, Americans answered!

October 30, 2023, at ChickenCheck.in

Since 1992, chicken has claimed the top consumption spot in the American protein kingdom, and consumers aren't looking back anytime soon. When chicken first became our nation's favorite protein over 30 years ago, the average American ate 66.5 pounds of chicken per year. Chicken consumption has steadily gained momentum—almost annually—and in 2022, the average American dined on 100.6 pounds of chicken! What's more, national chicken consumption is projected to jump even higher in 2023 and 2024! ***Click here for full article***

Propane retail prices at ~$1.26/gal.

November 28, 2023, Submitted by Dale Barnett, Johnson Energy Solutions

The Mont Belvieu **Propane Spot Price** on Nov. 20, 2023, was at $**0.66/gal.** which is a slight decrease over the futures market coming out of the summer months. The lowest spot price experienced during 2023 has been $0.525 on July 3rd and the highest was in January when it reached $0.938. Are you locked in at a good price?

Allowing for an average of $0.60 per gallon for tariffs, handling and delivery to most areas, **the average current retail price can be expected to be roughly $1.26/gal.** Larger accounts can often negotiate a lower price agreement by as much as $0.05/gal., or more. To follow Mont Belvieu spot pricing go to https://www.eia.gov/dnav/pet/hist/eer_epllpa_pf4_y44mb_dpgD.htm. TPA's allied member propane companies welcome discussing this with you to obtain best pricing and services. Their contact information is at the back of this newsletter in the allied member listings.

Propane futures were previously established in June to increase to $0.655 in Dec. and are now listed at $0.63785. Spot price futures were previous forecasted in June to reach $0.80 by the first of the year in 2024 and are now at $0.62625 for January. Futures fluctuated minimally over the summer months, staying in the $0.61-0.63 range into the fall months for 2024 before rising to $0.68 later this year. To follow the futures trading for spot pricing go to https://www.cmegroup.com/trading/energy/petrochemicals/mont-belvieu-propane-5-decimals-swap.html#.

For **REAP grant funding** for energy retrofit projects go to https://www.rd.usda.gov/programs-services/rural-energy-america-program-renewable-energy-systems-energy-efficiency. The next **application deadlines** are Dec. 31, 2023, and March 31, 2024. You can find more information on pages 43-44 of this newsletter or by visiting your local NRCS county office.

For current updates anytime for **FMCSA emergency declarations, HOS waivers, and exemptions** go to https://www.fmcsa.dot.gov/emergency-declarations.

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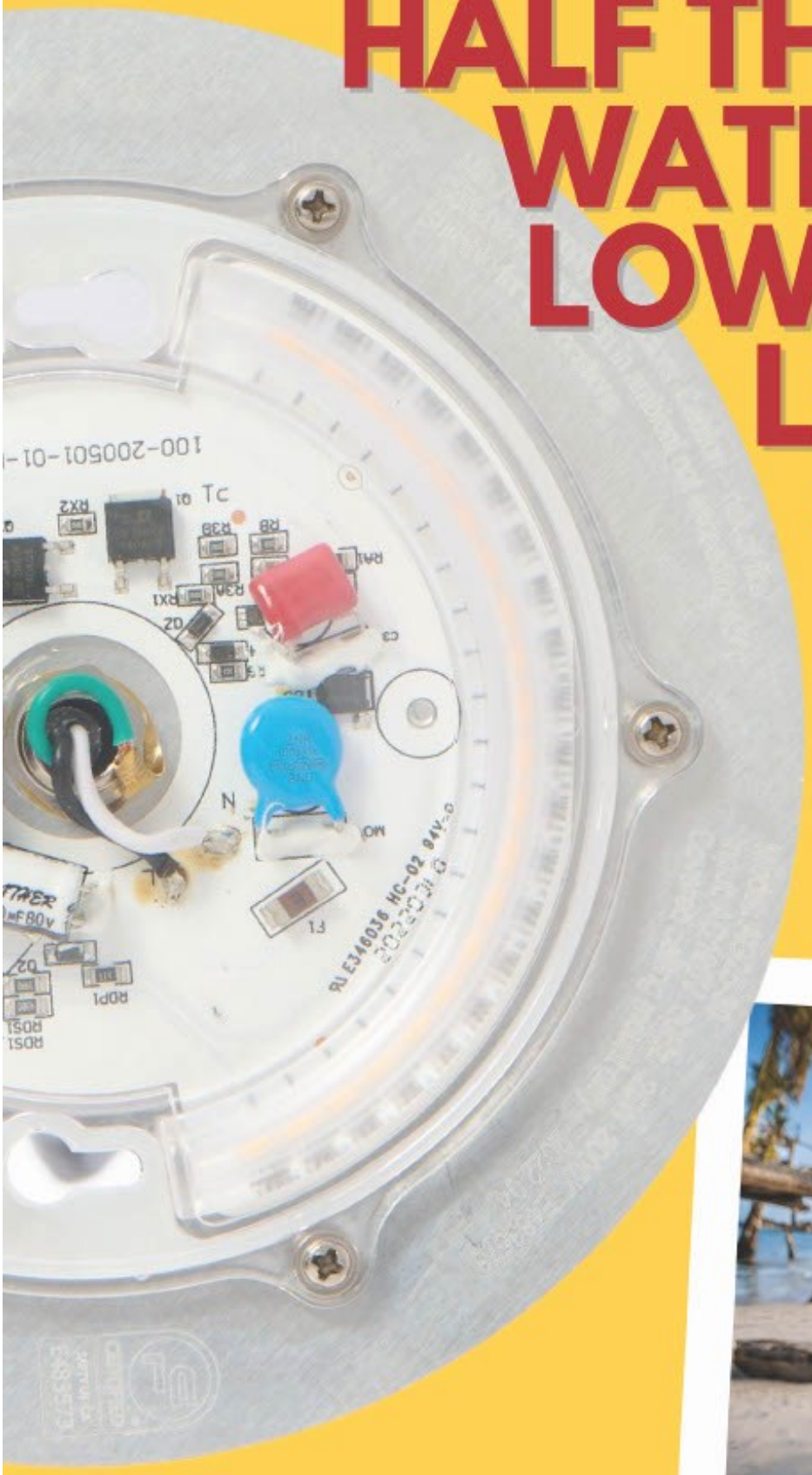

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www.poultrylights.com

Wood heat exchangers promote drier litter, better footpad quality

June 16, 2023, at ModernPoultry.media

External wood heat exchangers have a positive effect on broiler production compared to radiant propane brooders, which are generally used to heat US poultry houses.

In a study led by *Victoria Ayres, PhD*, assistant professor at **Tennessee Tech University**, birds in four treatment groups were placed in identical rooms heated using the different methods.

The research team found that the external heating system led to drier litter at day 21 of the experiment, better footpad quality at day 35 and a reduction in levels of serum interleukin-6, associated with infection and inflammation, at day 23. *Click here for full article*

Selecting for water efficiency offers promise in broilers

September 19, 2023, at ModernPoultry.media

Selecting broilers for water-conversion ratio has no effect on other economically important traits, potentially paving the way for a route to greater sustainability in production. In work presented at the International Poultry Scientific Forum, researchers at **University of Tennessee** bred a line of high water-conversion ratio birds, which are more water efficient, and another of low water-conversion ratio to assess the impact of this selection by the fourth generation. *Click here for full article*

Poultry scientists get fuller picture of PM effects in different housing systems

November 25, 2023, at ModernPoultry.media

Poultry scientists are working to better understand the impacts of particulate matter (PM) on bird health and production. Particulate matter includes very small particles of feed, feathers, animal waste and dander. Researchers have found that PM can absorb and carry potential harmful pollutants and pathogens, putting poultry at risk of respiratory diseases and lung damage. In a new research review, a team of scientists from Nanjing Agricultural University take stock of what we know so far about the effects of PM on poultry health. *Click here for full article*

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Darkling beetles are problematic and costly pests to poultry health

August 15, 2023, at PoultryTimes.com by David B. Strickland

Not just a pesky pest, but a potential costly one, is the darkling beetle. These insects can affect bird health, spread diseases, and cause many problems for producers. ***Click here for full article***

Researchers investigate new options for bed bug control in poultry houses

October 15, 2023 at ModernPoultry.media

There are many pests and pathogens to monitor on poultry farms, but bed bugs typically are not top of mind. Nevertheless, bed bug infestations have been resurfacing in U.S. poultry farms. Does that present a health, performance or welfare problem for flocks? While there's almost no research on bed bugs' impact on poultry health, it is reasonable to expect that the biting and blood-feeding associated with infestations can cause stress, infections, anemia, secondary diseases and a decline in production. ***Click here for full article***

Can sound alter layer gene expression?

September 27, 2023, at PoultryWorld.net by Tony McDougal

One of the most fundamental welfare and economic issues facing the poultry industry could be resolved through sound waves. ***Click here for full article***

Decoded chicken genome may drive breakthroughs in health, performance

June 21, 2023, at ModernPoultry.media

Genomic information on chickens compiled by University of California-Davis scientists could help unlock improvements in the poultry sector. ***Click here for full article***

The importance of maintaining uniform bird densities

September 29, 2023, at PoultryProducer.com by Jim

Managing by the "average" of anything can be a potentially dangerous concept when it comes to growing birds. For instance, when tunnel ventilating market-age broilers the average house temperature could be 80oF, which isn't necessarily a problem, but it hides the fact that it could be 70oF at the pad end and 90oF at the fan end of the house which definitely would be dangerous. During cold weather, an average daily relative humidity of 60% seems ideal, but in reality, the RH could be 40% during the day and 80% during the night, which could lead to an increased likelihood of respiratory issues. Last but not least, though our birds may have been placed at a relatively low density, it does not necessarily mean that all the birds will have the same amount of space to eat, drink and move around. ***Click here for full article***

Supporting good leg health in broilers

October 24, 2023, at ThePoultrySite.com by Magali Charles, DVM | Suttisak Boonyoung, Ph.D.,

When building a house, the foundation is the most critical part. If the structure of the concrete is compromised, the walls won't be stable, leading to wall cracks. Similarly, the skeleton represents the foundation of the body, and the bones must be strong to support the entire body, particularly the muscles. ***Click here for full article***

Vit C and green tea extract aids broilers with heat stress

September 28, 2023, at PoultryWorld.net by Tony McDougal

Scientists have found that feeding broilers antioxidants such as green tea extract and vitamin C can alleviate stress brought on by high temperatures. ***Click here for full article***

Optimal broiler weight gain tied to body temperature, mgmt details

November 20, 2023, at ModernPoultry.media

As most producers know, poultry performance can suffer during periods of high temperature. Modern housing is designed to maintain environmental temperatures within an optimal range, but how does the temperature of individual birds impact their weight gain? A recent field study by the University of Georgia looked at the relationship between weight gain and body temperature in broilers. ***Click here for full article***

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Alternative proteins beyond the hype

September 12, 2023, at PoultryWorld.net

The dreamt breakthrough of alternative proteins looks to have stalled. After riding the hype for a couple of years, there is trouble in paradise. Large brands like Nestlé have pulled back from the market, Meatless Farm went bust, and Beyond Meat saw share prices drop from an all-time high of $234 to under $15. *Click here for full article*

Alt meat companies stop operations

September 15, 2023, at MeatPoultry.com by Monica Watrous

Two venture-backed startups are ceasing operations amid declining demand for meat alternatives. The leaders of Hooray Foods and Nowadays, both based in San Francisco, shared plans to end production in separate social media posts. *Click here for full article*

Florida legislator seeks ban on cultivated meat

November 17, 2023, at MeatPoultry.com by Ryan McCarthy

A Florida state representative recently introduced a bill that would halt the production of cultivated meat. *Click here for full article*

Real MEAT Act reintroduced by senator

November 16, 2023, at MeatPoultry.com by Ryan McCarthy

US Senator Deb Fischer (R-Neb.) decided on Nov. 14 to reintroduce the Real Marketing Edible Artificials Truthfully Act, also known as the Real MEAT Act. *Click here for full article*

JBS breaks ground on cultivated protein research facility

September 25, 2023, in MeatingPlace.com by Melissa Sue Sorrells

JBS recently announced it began construction on a cultivated protein research and development center in Brazil. *Click here for full article*

ICBA named First Financial Bank as the top ag lender in the nation for 2023 in the 1 billion asset category.

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What about hybrid meat? Food safety questions arise

September 19, 2023, at FoodSafetyNews.com by Cookson Beecher

All meat? Or no meat? Or what about something in between? That would be "hybrid meat." What in the world is that? In this case, it would be made by mixing cultivated meat, often called cultured or lab meat, with plant-based meat. ***Click here for full article***

Labeling lab-grown meat and poultry isn't likely to be easy

November 21, 2023, at FoodSafetyNews.com by Dan Flynn

The USDA's Food Safety and Inspection Service (FSIS) has a labeling manual that runs about 40 pages. And it seems there are always petitions for labeling changes in the pipeline. The bottom line is labeling can quickly become a complicated subject. And some try to skirt the whole need for labeling competition. At issue now is what to do when lab-grown meat and poultry is on the market. ***Click here for full article***

Are plant-based restaurant chains doomed?

November 27, 2023, at alt-meat.net by Melissa Sue Sorrells

In the world of plant-based alt-meats, there's never any shortage of worrisome news, and lately, a spate of plant-based QSRs have seemingly been taken down at the knees. ***Click here for full article***

Deja vu: Double-digit monthly declines for alt-meat retail sales

November 27, 2023, at alt-meat.net by Lisa M. Keefe

Meat analogue sales through retail stores continued their deceleration in October. ***Click here for full article***

2024 GROWER MEETINGS

WOTUS Update: EPA revises 2023 rule in light of Sackett decision

August 30, 2023, at NationalAgLawCenter.org by Brigit Rollins

On August 29, 2023, the Environmental Protection Agency ("EPA") released an updated version of its 2023 rule to define the crucial Clean Water Act ("CWA") term "waters of the United States," also known as WOTUS. The term is central to implementation of the CWA because only those water bodies that meet the definition of WOTUS are subject to the CWA's permitting programs which are one of the primary ways that the CWA works to limit water pollution. In the decades since the CWA was passed, defining WOTUS has proven a challenge for both EPA and the courts. The definition of WOTUS has changed multiple times over the years, with roughly four different rule changes since 2015 alone. This has created confusion and inconsistency for landowners and other parties affected by the CWA. ***Click here for full article***

Clean Water Act

October 26, 2023, at The Feed Newsletter

Democrats in the U.S. House of Representatives have proposed an amendment to the Clean Water Act that aims to more clearly define the federal government's jurisdiction. The proposed Clean Water Act of 2023 replaces the term "waters of the United States" (WOTUS) with "protected water resources." These resources would be broadly defined to include waters subject to ebb and flow of the tide, territorial seas, and all interstate and intrastate waters and their tributaries. The proposed amendment comes in response to concerns about the narrowing of wetlands protection under the Supreme Court's rulings. To learn more about the Supreme Court's recent WOTUS decision, ***click here*** to read NALC article "WOTUS Update: U.S. Supreme Court Revisits Wetlands Jurisdiction Under the CWA."

House Oks bill repealing WOTUS rule, Senate up next

November 2023, at MeatingPlace.com

The U.S. House of Representatives this week passed a repeal of the Waters of the United States (WOTUS) rule. Part of the 2024 Interior and Environment appropriations bill, the provision addresses the federal regulation of wetlands and streams. The bill funds the Interior Department, the Environmental Protection Agency (EPA), and related agencies while blocking the Biden administration's WOTUS effort earlier this year to expand Clean Water Act protections. In August, EPA issued its final rule to amend the WOTUS rule, which a U.S. Supreme Court order rolled back from the stricter policy sought by the White House. ***Click here for full article***

States filed amended complaint over WOTUS rules

November 2023 at MeatingPlace.com

Despite recent changes to the Environmental Protection Agency's Water of the U.S. rule, 24 states filed an amended complaint in federal court this week. The states argued that the federal government overreached its statutory jurisdiction, violated the Administrative Procedure Act, and infringed on constitutional rights. ***Click here for full article***

Scientists call for revisions to EPA's broiler emissions models

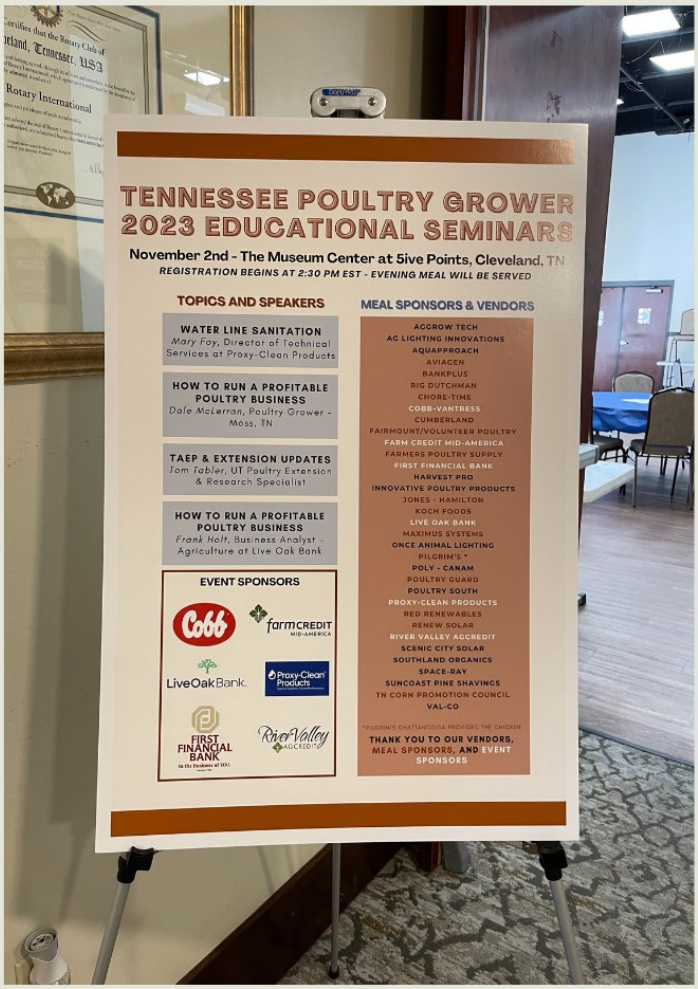
October 20, 2023, at ModernPoultry.media

The Environmental Protection Agency (EPA) wants to use updated computerized models to guide regulation of air pollution by animal feeding operations, including broiler chicken farms. Live production managers and others are supposed to use these models to determine whether a farm's emissions exceed established limits for five major air pollutants, which would trigger regulatory permitting. However, a team of researchers with U.S.-based universities recently conducted an "external review" of the EPA's draft of these emissions models, which were published in August 2021. ***Click here for full article***

Researchers comment on proposed EPA models for predicting broiler operation emissions

November 28, 2023, at MorningAgClips.com

Proposed federal draft models designed to guide emissions forecasting for broiler operations need improvement and clarification, according to an in-depth analysis led by Iowa State University scientists. In August, the U.S. Environmental Protection Agency (EPA) released a set of draft models to estimate daily levels of ammonia, hydrogen sulfide and several types of particulate matter (dust) typically emitted from U.S. broiler operations. The original data stemmed from the National Air Emissions Monitoring Study (NAEMS), which measured emissions to eventually guide Clean Air Act policies for livestock and poultry operations. Once finalized, the EPA emissions models may be used by animal feeding operations to determine whether their emissions trigger air quality reporting requirements. ***Click here for full article***



Martin and Cleveland

2024 Grower Meetings

Labeling petition over 'free range' policy is still getting comments after six months

October 19, 2023, at FoodSafetyNews.com by Dan Flynn

The petition Perdue Farms Inc. filed with USDA's Food Safety and Inspection Service (FSIS) March 16 is still generating comments. The petition was assigned to the FSIS Office of Policy and Program Development. *Click here for full article*

USDA updates rule on poultry farm contracts

November 8, 2023, at MeatPoultry.com by Ryan McCarthy

The US Department of Agriculture and Agriculture Secretary Tom Vilsack updated how the agency plans to approach competition issues in agricultural markets.

On Nov. 8, Vilsack and the USDA finalized a series of rules under the Packers and Stockyards Act, including helping contract poultry growers compete and understand agreement terms with major processing companies. *Click here for full article*

NCC critical of USDA poultry contract regulations

November 9, 2023, at MeatPoultry.com by Ryan McCarthy

After the US Department of Agriculture announced updated rules to provide more transparency on contracts between processors and poultry producers on Nov. 8, several associations announced their positions on the issue.

The National Chicken Council (NCC) stated that a final rule under the Packers and Stockyards Act would have a devastating financial impact on the US chicken industry by raising costs and administrative burdens. *Click here for full article*

Poultry farm contract rules move forward

November 28, 2023, at MeatPoultry.com by Ryan McCarthy

The Federal Register stated that the final rule would take effect in February 2024. *Click here for full article*

USDA launches program to support agricultural employers & farmworkers

September 25, 2023, at MorningAgClips.com

The Biden-Harris Administration has announced that agricultural employers can begin to apply for a pilot program designed to improve the resiliency of the food and agricultural supply chain by addressing workforce challenges farmers and ranchers face. *Click here for full article*

Technology

How precision poultry farming could boost ESG goals

September 11, 2023, at WattAgNet.com by Elizabeth Doughman

Cameras, microphones, and other Internet of Things (IoT) sensors could help growers and integrators proactively address poultry health, welfare, and equipment challenges, while also aiding company environmental, social and governance (ESG) goals. *Click here for full article*

Precision livestock farming: Taking poultry growing to the next level

October 22, 2023, at ModernPoultry.media by Tom Tabler, PhD

Precision Livestock Farming (PLF) is the use of technology to automatically monitor livestock and the farm environment in real time to aid in farm management. PLF technology can tirelessly monitor flock status 24/7 and give early warnings when something is amiss so growers can correct the problem before it gets worse. *Click here for full article*

‘Machine Vision’ technology shows promise for monitoring bird behaviors, health

June 16, 2023, at ModernPoultry.media

With an eye on more timely and accurate monitoring of bird behaviors and health, researchers at the University of Georgia are evaluating a technology based on machine learning to successfully track cage-free layers on the litter floor and accurately detect birds under different light intensities and from varying angles. ***Click here for full article***

Smart ag technologies for poultry take data collection, mgmt to new level

June 21, 2023, at ModernPoultry.media

Smart ag technologies offer production and research benefits by providing real-time data on individual birds and at the flock level to optimize production, animal health, and well-being, food safety and the environment. “Smart ag is the future of agriculture,” said Martin Zuidhof, PhD, professor at the University of Alberta. “It’s about sensing what’s going on with the bird and its environment, analyzing the data, making a decision and turning that into action.” ***Click here for full article***

AI-powered feed inventory tools drive efficiency and profits

September 7, 2023, at FeedStrategy.com by Elise Schafer

How digital sensors and cloud-based analytics are reshaping the industry, leading to cost savings, environmental gains, and better livestock care. ***Click here for full article***

AI could control poultry house variables wirelessly

November 21, 2023, at WattAgNet.com by Elizabeth Doughman

Wireless mesh technology that uses artificial intelligence (AI) could analyze and proactively adjust a range of poultry house environmental controls, saving on energy costs and boosting poultry performance. ***Click here for full article***

Researchers study poultry health through audio signals

October 5, 2023, at PoultryWorld.net by Tony McDougal

Researchers conducted a study geared towards compiling a dataset of chickens that were both healthy and unhealthy based on sounds. ***Click here for full article***

Big data could aid in early detection of coccidiosis

October 11, 2023, at WattAgNet.com by Meredith Dawson

A system that can detect coccidiosis or potentially other diseases in flocks immediately, according to a daily or weekly collection of bird and health information, could allow for early intervention before animal performance declines and improve the poultry producer’s return on investment. ***Click here for full article***

4 technologies shaping the future of Salmonella control

November 2, 2023, at WattAgNet.com by Elizabeth Doughman

Learn how new innovations could improve food safety. ***Click here for full article***

What will the future of poultry technologies be?

November 7, 2023, at WattAgNet.com by Elizabeth Doughman

Elizabeth Doughman: Advances in digital technologies and innovation could dramatically transform the poultry industry over the coming years, improving bird health and welfare and improving productivity and profit. However, there are some challenges that need to be overcome first. ***Click here for full article***

Video: AI robotics and poultry processing

November 28, 2023, at PoultryProducer.com by Sophi Fairman

Artificial Intelligence (AI) is evolving exceptionally fast. Watch the Poultry Science Association's chat with Konrad Ahlin (Georgia Institute of Technology) to discuss how engineers are working to develop AI for poultry processing. Georgia Tech is one of several institutions coming together to conduct this research made possible through funding by the USDA's National Institute of Food and Agriculture. ***Click here to watch the video***

Leakage calculators can maximize poultry house tightness

November 2, 2023, at WattAgNet.com by Mike Czarick

The key to minimizing fuel usage and maximizing bird performance, health and welfare during cold weather is simply maximizing poultry house tightness. If a producer can't control how much cold air is entering a house and where, it will be extremely difficult for them to control their heating costs or environmental conditions within the house. ***Click here for full article***

Can augmented reality fix poultry's labor challenges?

September 26, 2023, at WattAgNet.com by Elizabeth Doughman

Tools that support virtual reality (VR) and augmented reality (AR) could make automation and robotics more practical for poultry processing environments. "Good, reliable labor is getting harder and harder to come by. This is a key reason the industry is adopting as much automation as they can. However, there are still tasks that robotics and automation has not solved that are still fully manual," Colin Usher, research scientist, Georgia Tech Research Institute, explained. ***Click here for full article***

Other news

TN Department of Agriculture | Animal Health

Mr. **Eric Medley** has joined the TN Department of Ag's Animal Health division as Poultry Program Coordinator. He will be managing the NPIP program and database. Eric is originally from Cookeville, TN, but currently resides in Cross Plains, TN. He graduated from Tennessee Tech University in 2012. He spent five working for Tyson in Albany, Kentucky servicing breeder layers, breeder pullets, and broilers. Eric has been married to his wife Katie for seven years. They have two children Ava and Ella.

A Year of Giving: How the U.S. chicken industry gave back in 2023

December 7, 2023, at ChickenCheck.in

Who doesn't want to eat protein that's as delicious as it is nutritious, plus affordable and safe, all while being sustainable for the environment? All of these factors make chicken America's No. 1 protein. These qualities also position chicken as an essential, high-quality protein that can help end hunger in our nation and world. In fact, the meat and poultry category is one of the most purchased and consumed food items by Supplemental Nutrition Assistance Program (SNAP) households, and proteins like chicken are one of the top 3 most requested items at food banks. ***Click here for full article***

Poultry to comprise 40% global meat production in 2023

November 14, 2023, at WattAgNet.com by Meredith Dawson

Poultry meat is the most produced meat, with more than 142 million metric tons in 2023. ***Click here for full article***

USPOULTRY Foundation allocates $297,580 in student recruiting grants

November 8, 2023, at PoultryFoundation.org

The USPOULTRY Foundation awarded student recruiting grants totaling $297,580 to six U.S. universities with Poultry Science departments and 20 other institutions with industry-related programs. The Foundation provides annual recruiting and retention funds to colleges and universities to attract or connect students to their poultry programs and the industry. The grants were made possible in part by gifts to the USPOULTRY Foundation from companies, individuals and families, in addition to funds earned over the years from the International Poultry Expo, part of the International Production & Processing Expo. ***Click here for full article***

Northern Fowl Mite Management

The northern fowl mite, *Ornithonyssus sylviarum*, is regarded as the primary and **most serious ectoparasite of poultry** in North America (Axtell and Arends, 1990), as well as in Mississippi. Mites and lice are the most destructive external parasites of the state's poultry flocks (Goddard and Edwards, 2010). The northern fowl mite is common on wild birds and rodents, which readily introduce it into commercial poultry production facilities unless sound biosecurity practices are in place. Its entire life cycle is spent on the host, where it feeds on blood and is a source of irritation to the bird. Eggs are laid in masses at the base of the feathers, usually in the vent area. It is **one of three species of fowl mite** that are ongoing pests of commercial breeder and layer flocks.

The other two are 1) the chicken mite or red poultry mite (*Dermanyssus gallinae*), which stays hidden in cracks and crevices in the poultry house during the day and comes out to feed on the birds at night, and 2) the tropical fowl mite (*Ornithonyssus bursa*), which has similarities to the northern fowl mite. Because the red poultry mite remains hidden much of the time and can go for long periods without feeding, it is very difficult to detect (unless birds are inspected at night when mites are feeding) and even more difficult to control. The tropical fowl mite is often confused with, and has similar behavior patterns to, the northern fowl mite. It spends its entire life on the host and does not survive for long if dislodged or separated from its food source.

Life Cycle and Transmission

The eight-legged adult northern fowl mite is about 1/26 inch long and dark red to black. There are **four stages in the mite life cycle**: egg, larva, nymph, and adult. The complete life cycle from egg to egg-laying female can be as little as five to seven days. This can result in rapid increases in mite populations, especially on layers and breeders kept for extended periods. Female adult mites lay eggs directly on their host. The eggs hatch in one to two days, depending on the temperature and humidity. The larvae that hatch do not feed on the bird; however, larvae rapidly molt to the nymphal stage in about eight hours (Kaufman et al., 1998). The nymphs do feed on blood from the birds and mature in four to seven days. Adult female mites complete the egg-laying process in two days after taking a blood meal from their host. The number of eggs laid per female is relatively small, usually two to five. However, as mentioned earlier, the short life cycle means that **mite populations can rise rapidly**, with newly infested birds capable of supporting a mite population in excess of 20,000 per bird in nine to ten weeks under favorable conditions (Williams, 2010). Mites tend to congregate near the vent area, but the back is also a popular site as the mite population increases.

Birds infested with large northern fowl mite populations may suffer severe anemia and even death. DeLoach and DeVaney (1981) reported that heavy infestations can **remove as much as 6 percent of the blood volume of a commercial laying hen per day**. Heavy infestations on commercial pullets as they begin laying can cause a 10 to 30 percent mortality rate (Strother, 2008). Mite-stressed birds usually reduce feed intake, lose weight rapidly, may exhibit a pale pink comb (a symptom of anemia), and may have lowered egg production of 10 percent or more (Williams, 2010). Heavy infestations may make birds more susceptible to other parasites and diseases that can result in death (Strother, 2008). In broiler breeder flocks, mites are also thought to **impact semen production in males**. However, the literature is not in total agreement on all impacts or at what level these impacts exist (Hogsette et al., 1991).

Northern fowl mites prefer temperatures around 65 to 68 °F and are often more of a problem during cool weather, but they may be found on birds at any time of year. Even though they spend the majority of their time on the host, a well-fed northern fowl mite may survive for two to three weeks off the host, at room temperature. Therefore, depopulating an infested flock and moving birds back into the house sooner than three weeks may not totally resolve a mite problem. However, northern fowl mites are not as hardy as red poultry mites (which can survive without feeding for several months) and generally die within three to four days without a host.

Mites are **easily transmitted from bird to bird** by direct contact or by crawling from one bird to another. A mite-free house can become infested by several different methods including people, a contaminated pullet hauling trailer, the introduction of an infested pullet flock, wild birds, rodents, or contaminated egg flats and racks that are hauled from farm to farm by the egg truck. Birds older than 40 weeks usually do not support large mite

populations, but populations can build rapidly on birds 20 to 30 weeks of age (Williams, 2010). A severe northern fowl mite infestation can develop and spread through a flock in three to six weeks.

Light infestations of mites often go unnoticed and are difficult to identify. You may **notice mites on eggs or egg handlers** before they are found on the birds. However, by the time mites start showing up on eggs or workers begin to complain of mites, the infestation is usually well past the light stage and into the moderate or heavy stage. Individual mites on birds are nearly microscopic and may easily be missed as they crawl quickly across the skin near the vent area. Heavier infestations are easier to find because they produce a dark gray discoloration and matting of feathers around the vent. The discoloration is the result of large populations of mites, mite eggs, their feces, and shed skins.

Best Control is Prevention

Prevention is by far the best and most effective method of fowl mite control. Take steps to exclude mite vectors such as wild birds and rodents from the poultry house, and prevent the movement of mites from one farm to another on egg flats, racks, other equipment, or people. Promptly clean up spilled feed around feed bins or elsewhere before it attracts wild birds and rodents. **Maintain bait stations** along exterior and interior poultry house walls year-round, when birds are present and in between flocks. Also monitor rodent activity around generator sheds, well houses, stacking sheds, and other nearby buildings, and take appropriate measures to control the rodent population.

Keeping wild birds and rodents out of production houses means sealing up the holes and any possible entry points, including (Stringham and Watson, 2003)—

- end doors
- electrical conduits and feed and water lines where they enter the building
- fan housings
- along eaves and at building corners
- ridge vents and other air inlets
- sidewall curtains
- evaporative cooling systems (dog houses)
- damaged siding or foundations

Monitoring birds on a weekly or bimonthly basis is critical to detecting a mite problem early. Mite indexing systems that assign a one-digit number to various infestation levels have been in place for a number of years. However, they are often time-consuming and require the examination of a fairly large number of birds to get an accurate estimation for the flock. A typical mite index may be similar to the following:

0 = no mites
1 = 1 to 50 mites (light infestation)
2 = 50 to 1,000 mites (moderate infestation)—small clumps of mites on skin and beginnings of discoloration and matting around feathers
3 = 1,000 to 25,000 mites (moderate to heavy infestation)—more discoloration and accumulation on feathers and around vent
4 = >25,000 mites (heavy infestation)—numerous large clumps of mites on skin and feathers, and skin pocketed with scabs

Even though a one-digit rating system based on the number of mites per bird has been the standard for years, a more practical system may be simply a "present" or "absent" designation on 7 to 30 birds per house in a weekly inspection group, with a percentage of birds with mites present used as a threshold (Stringham and Watson, 2003). The more birds examined each week, the more accurate your monitoring program will be.

In a flock of breeder birds, the **roosters often have higher populations** of northern fowl mites than do the hens (Axtell and Arends, 1990). Mites readily spread from the roosters to the hens. Therefore, roosters should be examined at a higher ratio to the hens. To date, a vaccine to provide the birds with immunity to mites has not been developed. Although the production of antibodies as a result of mite infestations have been detected, a way to use this information to quantify the level of infestation or predict its impact does not currently exist (Axtell and Arends, 1990).

Prevention is made more difficult simply because any person, wild bird, rodent, animal, vehicle, or equipment moving between farms is a potential fowl mite vector. However, Stringham and Watson (2003) recommend these minimal precautions to greatly reduce the likelihood of spreading a fowl mite infestation:

- Isolate infected farms. Readjust traffic flows from infested to clean farms and take precautions with all protective clothing worn.
- At the hatchery, pay close attention to egg deliveries from infested farms. This includes strictly managing personnel, vehicles, racks, egg flats, and other equipment that have contact with infested farms.
- Pullet-moving and cleanout crews should take precautions to limit the risk of spreading a mite infestation (washing, sanitation, traffic flow, etc.).

Treatment Options Limited

Treatment for mites is difficult, expensive, and may be only partially successful. Unfortunately, **mites have developed at least partial resistance to many of the chemicals** used to treat an infestation. Furthermore, new promising substitute products for mite control will probably not become available anytime soon. **Sulfur was used as a miticide** in the past and is being used again in certain parts of the country with some degree of success

(Clark, 2013). Compared to many other products, sulfur is inexpensive and relatively easy to apply, but it has to be done correctly and even then may provide only partial suppression of mite infestations.

Unfortunately, however, **many growers are allergic to sulfur** or they use it wrong. They may "dust" it in with a backpack blower and their fans, but this gives poor coverage on the birds (Hubbard, 2013). Some growers simply open several bags of sulfur in the house and expect the chickens to "dust themselves," but this is not effective. In addition, the dust formulation method of treatment may not place the active ingredient directly on the birds' skin where it will do the most good. **Products used to kill mites do not kill the eggs,** so you have to come back in a few days and treat again (Hubbard, 2013). The seven-day life cycle means that if you wait more than about seven days before treating a second time, a whole new generation of mites have developed from hatched eggs that were unaffected by the initial treatment. Growers often only treat once when it may take at least three treatments strategically spaced close together to get all the mites from recent hatchings.

Another product that has yielded varying degrees of success is diatomaceous earth (DE). **Diatomaceous earth is believed to be a natural insect control** powder. It is obtained from deposits of diatomite, which are the fossilized sedimentary layers of tiny phytoplankton called diatoms. DE is a form of amorphous silica that can kill insects by absorbing their oily or waxy cuticle layer (Jacob et al., 2011). When this thin, waterproof layer is lost, the insect loses water and dies. In addition to its desiccant action, DE works abrasively to rupture insect cuticles. However, like sulfur, when used as a dust, it may not reach the birds' skin where the mites live. Also, a single treatment will likely not get all the mites that hatch after the initial treatment, so the infestation may quickly re-establish itself unless multiple treatments are used at strategic intervals.

In some breeder flocks where nothing else seems to work, **extra-label use of ivermectin** has proven an effective method of control for the northern fowl mite. Like other products, it appears to work best when at least two treatments are made a few days apart. It is expensive but may be cost-effective depending on the severity of the problem, especially if other options have been exhausted with little or no results. It can sometimes be difficult to keep in solution and has to be used with propylene glycol, but even more important, **ivermectin is not labeled for use on poultry** (Hubbard, 2013). This means you must get **a prescription from a licensed veterinarian** before using it on breeder flocks.

Summary

Northern fowl mites are a serious threat to breeder and layer flocks not only in Mississippi but throughout North America. Control depends first and foremost on prevention. Take every precaution to reduce the risk of establishing a fowl mite infestation on your farm:

- Establish a thorough disinfection and treatment program for houses before a new flock is placed.
- Prevent rodent and wild bird access to your houses.
- Bring in only uninfested pullets.
- Monitor birds on a regular basis.
- Control the movement of traffic, equipment, and personnel between clean and infested farms and the hatchery.

Treatment options are limited and may be only partially effective, which makes prevention even more important.

References furnished upon request.

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Commodity Report

November 30, 2023, at Egg-News.com by Dr. Simon M. Shane

OVERVIEW

At 15H00 on November 30th the CME price for corn was down 1.7 percent compared to the previous week to 460 cents per bushel for December delivery. Prices of commodities were influenced by profit taking, and a realization of the size of the 2023 crop. Export orders for the current year have increased sharply and prices are indirectly influenced by events in the Black Sea. Orders by China resumed at the end of the 2022-2023 market year and extended through November. The demand for ethanol was stable this past week. Prices are trending higher week-to-week despite a projection for a higher ending stock of corn.

Soybeans were down 1.1 percent from last week to 1,343 cents per bushel for January 2024 delivery. Prices during the week generally responded to predictions of crop size, export orders, and ending stocks with some profit taking.

Soybean meal was down 3.7 percent to $441 per ton for December delivery. Price was influenced by demand coupled with record high crush volue in October. Price will fluctuate to reflect the CME price for soybeans and the demand for soy oil that is rising. The market previously responded to increased crop size and higher stocks included in the November WASDE Report reflecting the 2023 crop.

WTI was 1.0 percent higher from last week to $77.86 on November 29th, attributed to stable demand and higher U.S. reserves despite the possible effect of conflict in the Middle East and threats of production cuts by OPEC. There was only minor fluctuation in price during the week ($76.80 to $77.90). Crude oil inventory in the U.S., other than the Strategic Reserve, was up to 27.7 million barrels from 26.5 million barrels, last week.

Factors influencing commodity prices in either direction over the past four weeks included:

- Weather conditions in areas of the world growing corn and oilseeds especially under the influence of a strong *El Nino* The 2023 U.S. harvest is functionally complete ahead of 2022 (downward pressure).
- Geopolitical considerations continue to move markets. Cancellation of the BSGI in July and ongoing attacks on Ukraine port facilities impact prices of wheat, corn, oilseeds and vegetable oils. Russia has unsuccessfully attempted to implement a Black Sea blockade on Ukraine that raises prospects for further asymmetric responses by Ukraine and even possible international intervention. Loaded bulk vessels are sailing from Chornomorsk, Odesa and also from Danube River ports using the 'Humanitarian Corridor" to various destinations. The costal route is operational despite threats by the Russian Federation to mine the entrance to ports and deploy airborne missiles. (Upward pressure on corn and wheat and an indirect effect on soybeans)
- Macroeconomic U.S. factors.
- Most economists in academia and the private sector are confident of a "soft landing" for the economy following the release of Q3 GDP and recent economic parameters despite high bond rates. Inflation as measured by CPI declined from 8.9 percent in June 2022 to 3.2 percent in September as a result of 11 FOMC rate cuts that have not precipitated employment. There is evident stability in the bank sectors in both the U.S. and Europe. Large U.S. banks passed stringent "stress tests" in June.
- The Federal Reserve held the benchmark interest rate steady at the monthly FOMC meeting on November 1st. The Federal Reserve commentary indicated that the rate would be held high for a prolonged period in the range of 5.25 to 5.50 percent. Chairman Powell in Congressional testimony and documented in FOMC minutes has indicated that additional increases should be expected with observers anticipating one more rate hike in early 2024 to restore inflation to near an annual 2.0 percent target by 2025. The value of 2.0 percent is now being questioned for validity.
- The Department of Commerce announced that the inflation rate in October attained 3.3 percent down from the 3.7 percent in August and September.
- The November 29th announcement of Q3 GDP confirmed a second estimate value of 5.2 percent, above the previous estimate of 4.9 percent mainly due to consumer spending and investment in inventory. In Q2 GDP growth attained 2.1 percent.
- The November 14th release of the October CPI confirmed a zero increase from September. The annual increase of 3.2 percent was the lowest rate since March 2021. The increase in the core value (minus food and energy) was 0.2 percent, in line with estimates. Food at home was up 0.3 percent from the previous month. Food away from home was up 0.4 percent from September 2022. Energy was down 2.5 percent, mainly due to gasoline and diesel fuels. The shelter category was up 0.5 percent. The macro trend is clearly towards reduced inflation due to a fall in energy prices. The CPI influences FOMC rate decisions.
- On November 30th the Bureau of Economic Analysis released the October Personal Consumption Expenditure index. This parameter closely followed by the Federal Reserve fell to 3.0 percent year-over-year from 3.4 percent in September. The core value, minus fuel and food fell to 3.5 percent from 3.7 percent in September.
- The October Producer Price Index for Final Demand (PPI) released on November 15th fell 0.5 percent over September that registered a 0.5 percent increase. The projection for October was for a 0.1 increase. The fall was attributed mainly to a 15.3 percent lower price of gasoline. The core PPI value excluding volatile fuel and food, was down 0.1 percent and down 2.9 percent from September 2022. Wholesale food was down 0.2 percent compared to a 0.7 percent increase in September.
- A Federal Reserve release on October 15th confirmed that industrial production increased 0.3 percent in September and was up 2.5 percent over the third quarter. Capacity utilization increased 0.2 percent to 79.7 corresponding to the 1972-2020 average.
- According to the November 2nd release by the U.S. Census Bureau the Manufacturers', Shipments, Inventories and Orders Survey, determined that new orders in September increased by 2.8 percent, following a rise of 1.0 percent in August. *(continued on next page)*

- The November 15th release of retail sales data showed a monthly fall of 0.1 percent in October. This value was below the revised September value of 0.9 percent. The Federal Reserve closely monitors this index as a measure of the trend in inflation.
- The ISM® Services Index for October declined to 51.8 from a September value of 53.6. The October Prices Index was 45.1, higher than in September at 43.8 driven by lower labor and energy costs.
- The Conference Board Consumer Confidence Index released on November 28th for October/November, rose to 102.0 points, up from a revised 00.1 for the preceding four-week period.
- The University of Michigan Index of Consumer Sentiment released on November 22nd fell from 63.8 in September/ October to 61.3 for October/ November. Both the Current Economic Index (70.6 down to 68.3) and the Index of Consumer Expectations (59.3 down to 56.8) denote a decline in consumer sentiment extending to the fourth consecutive month influenced by high interest rates and geopolitical concerns.
- Non-farm payrolls increased by 15,000 during October, as documented by the Bureau of Labor Statistics on November 15th. This was substantially lower than the average monthly gain of 258,000 over the previous 12 months. The average hourly wage rate in October was up 0.2 percent from September at $34 per hour. Wage rates are closely followed by the Federal Reserve, FOMC.
- The October Bureau of Labor Statistics report on November 1st estimated 9.6 million job openings in October.
- Initial jobless claims released on November 30th attained 218,000 for the week ending November 25th, up 7,000 from the revised value for the previous week and lower than the *Reuters* estimate of 220,000. The four-week moving average amounted to 220,000. The Bureau of Labor Statistics estimated 1.93 million continuing claims during the last week of November. There is evidence from October data that the labor market is cooling.
- The November Bureau of Labor Statistics report recorded a 4.7 percent increase in Productivity for Q3; Unit Labor Cost was down by 0.8 percent on a normalized basis and Hours Worked was up by 1.1 percent in Q3
- The ADP® reported on November 1st that private payrolls increased by 113,000 in October, up from 89,000 in September and compared with an estimate of 130,000. The increase in employment was mostly in the health and education sectors. The increase will not directly influence the probability of short-term future changes in interest rate since the ADP® is regarded by the FOMC as an unreliable statistic

FACTORS INFLUENCING COMMODITY PRICES

- The 2023 harvests of corn and soybeans are essentially complete. The December WASDE will provide an update on yields, volume, and ending stocks that are not expected to deviate from the November release.
- It is evident that both polarization in the closely divided chambers of Congress and intra-party conflict between and among both sides of the House will delay adoption of appropriations bills. Passage of the 2023 Farm Bill will be contentious and is subject to a 12-month extension as a stop-gap measure. Progress on the 2023 Farm Bill has been impeded by contention over SNAP eligibility and other entitlements that collectively represent 75 percent of total expenditure. The August 2nd downgrade of U.S. debt from AAA to AA+ by Fitch Ratings recognizes Congressional dysfunction. On November 10th Moody's downgraded U.S. credibility from 'stable' to 'negative' based on an inability to pass required fiscal legislation. The House failed to pass eleven appropriations bills and passed an 11th hour continuing resolution deferring action to November 17th to finance the Federal government. Again, failure to enact appropriations bills resulted in a second continuing resolution on November 15th freezing spending at FY 2013 levels pending votes on appropriations with extended deadlines of January 19th and February 2nd Little progress is apparent in the closely divided House under current leadership. A Federal shutdown would impact equity and commodity markets and the image of the U.S. governmental system.
- The November 9th WASDE #642 updated soybean production and predicted a record corn harvest for the new crop. There will be ample world availability of ingredients although inequitable distribution will result in shortages in some nations. Soybean exports will comprise 40 percent of the new crop with a rise in ending stock. (See WASDE Report in this edition confirming availability, use and ex-farm price projections)
- There is an expectation that for market-year 2023-2024, Brazil will achieve a record soybean harvest of 162 million metric tons (5,951 million bushels) with exports of 100 million metric tons (3,674 million bushels) and will crush 56 million metric tons (2,057 million bushels). A corn harvest of 130 million metric tons (5,117 million bushels) is anticipated with exports of 54 million metric tons (2,125 million bushels). (Lower prices in the future subject to favorable reports on crop progress and actual harvests)
- The Dollar Index (DXY) was 102.8 on November 29th, down 1.1 points from last week and a three-month low. The DXY has ranged from 99.6 to 111.3 over the past 52-weeks. The dollar index influences timing and volume of export orders and indirectly the price of WTI crude.

EXPORTS

The FAS Export Report, released on November 30th for the week ending November 23rd reflected carry-over of corn from market year 2022-2023. The report confirmed that outstanding export orders for corn amounted to 16.84 million metric tons (662.7 million bushels). Net orders for the past week for the 2023-2024 market year amounted to a substantial 1.93 million metric tons (75.9 million bushels). Shipments recorded during the past working week amounted to 0.50 million metric tons (19.7 million bushels). For the current market year to date cumulative export of 7.62 million metric tons (300.0 million bushels) is 32.0 percent higher compared to the equivalent week of the previous market year. For market year 2024-2025 outstanding orders attained 1.04 million metric tons (40.9 million bushels) with no sales this past week. (Conversion 39.36 bushels per metric ton. Quantities in metric tons rounded to 0.1 million)

(continued on next page)

The FAS Export Report for the week ending November 23rd reflecting market year 2023-2024 with carry-over from the previous market year, recorded outstanding export orders for soybeans amounting to 13.9 million metric tons (510.5 million bushels). Net orders this past week attained 1.9 million metric tons (69.6 million bushels). Shipments for the past working week attained a noteworthy 1.5 million metric tons (54.3 million bushels). For the current market year to date cumulative exports of 17.1 million metric tons (626.6 million bushels) are 9.4 percent lower compared to the equivalent week of the previous market year. Outstanding orders for the 2024-2025 market year are 9,000 metric tons (330,000 bushels) with no new sales this past week.(Conversion 36.74 bushels per metric ton)

For the week ending November 23rd, 2023, outstanding orders for soybean meal and cake with carry-over attained 4.4 million metric tons. Net orders this week for soybean meal and cake amounted to 64,600 metric tons. During the past week 269,800 metric tons of meal and cake combined were shipped. The quantity exported to date is 21.6 percent higher than the volume for the corresponding weeks of the previous market year. For the next market year outstanding sales have attained 4,700 metric tons with no orders this past week.

The November 9th, 2023, WASDE confirmed:

- Corn area planted for all purposes in 2023 ('new crop') attained 94.9 million acres, up 6.4 percent or 5.6 million acres from last year. Compared with the 2022 season, planted acreage is expected to be up or unchanged in 43 of the 48 estimating States. According to the November WASDE, yield was raised to 174.9 bushels per acre with a resulting 2,156 million bushel ending stock. The USDA lowered the average season ex-farm price to 485 cents per bushel.
- Soybean area planted for 2023 attained 83.6 million acres, down 5.1 percent from 88.1 million acres last year. Compared with last year, planted acreage is down or unchanged in 21 of the 29 estimating States. According to the November WASDE yield was raised 0.6 percent to 49.9 bushels per acre with a resulting 245 million bushels ending stock. The USDA retained an average season price of 1,290 cents per bushel.
- Crushers are expected to produce 54.15 million tons of soybean meal. Ending stocks will attain 400,000 tons. The USDA retained a price of price of $380 per ton.

The preference for planting corn over soybeans was based on a favorable projection of the corn to soy benefit ratio during March 2023.

COMMODITY PRICES

The following quotations for the months of delivery as indicated were posted by the CME at 15H00 on November 30th, 2023, compared with values at 15H00 on November 22nd, 2023 (in parentheses):

COMMODITY		
Corn (cents per bushel)	Dec. 460 (468)	March '24. 482 (487)
Soybeans (cents per bushel)	Jan. 1,343 (1,358)	March '24 1,372 (1,376)
Soybean meal ($ per ton)	Dec. 441 (458)	March '24 414 (424)

Changes in the price of corn, soybeans and soybean meal over five trading days this past week were:

Corn: Dec. quotation down 8 cents per bushel. (-1.7 percent)
Soybeans: Jan. quotation down 15 cents per bushel (-1.1 percent)
Soybean Meal: Dec. quotation down $17 per ton (-3.7 percent)

The CME spot prices for feedstuffs per short ton at close of trading on November 29th 2023 with prices for the previous week were:

- Corn (ZC): $170 per ton. Up $3 per ton from the previous week (+1.8 percent). 52-week range $166 to $246
- Soybean Meal (ZM): $427 per ton was $438. Down $11 per ton (-2.5 percent) from the previous week. 52-week range $370 to $4.96

Values for other common ingredients per short ton:

- Meat and Bone Meal, (According to the USDA *National AnimalBy-product Feedstuffs Report* on November 17th*): $405 to $430 per ton (Av. $410 per ton) for porcine (ex MN); $375 to $400 per ton (Av. $385 per ton) for ruminant (ex MN). Price varies according to plant and location
- According to the USDA *National Mill-Feeds and Miscellaneous Feedstuffs Report* on November 17th* wheat middlings from St. Louis, MO. and other states: $150 to $175 per ton (Av. $165 per ton)

* USDA did not report on previous week due to the Thanksgiving break.

- According to the University of Missouri Extension Service *By-Product Feed Price Listing* on November 29th DDGS, (IA. and other states) was priced at $195 to $260 (Av. $220 per ton). Price varies according to plant and location and is expected to fluctuate with the price of corn
- Bakery Meal, (MO & TX): $190 to $220 per ton.
- Rice Bran, (AR & TX): $150 to $200 per ton. (Av. $175).

For each $1 per ton (2.8 cents/bushel) change in corn the cost of egg production would change by 0.11 cent per dozen

For each $10 per ton change in the price of soybean meal the cost of egg production would change by 0.35 cent per dozen

The respective changes in the spot prices of corn and soybean meal on November 29th compared with November 22nd would decrease nest -run production cost for eggs by 0.2* cent per dozen. *(Rounded to 0.1cent) ***Click here for full report***

W 1135

BROILER LITTER MANAGEMENT

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The U.S. is among the world's largest poultry-producing countries. Two major products include meat from broiler and turkey production and table eggs from commercial layer operations. The combined value of these two products exceeded 35 billion dollars in 2020 (USDA-NASS, 2020). Poultry production provides an affordable and important source of protein consumed in the U.S and a livelihood for 1 million citizens. Approximately 18 percent of U.S. poultry products are exported. In Tennessee, broiler production is the most important poultry sector.

The poultry industry is now facing numerous challenges including the impact of infectious diseases and a growing demand for higher welfare standards. To reduce the susceptibility of chickens to infectious disease, the poultry production environment (particularly the litter) plays a critical role in fostering immune system and overall flock health. The efficiency of poultry production as well as animal welfare is greatly affected by the conditions inside the poultry house. One crucial factor which directly affects poultry performance and welfare is litter management. Some of the important factors in litter management include moisture control, ammonia control, litter depth and type of bedding. Maintaining a good quality litter is a management challenge for poultry producers particularly because "No Antibiotics Ever" (NAE) programs are now widely used by integrators.

CONCERNS WHEN USING BUILT-UP LITTER

Reusing poultry litter is a very common and cost-effective litter management technique used by broiler producers; however, reusing litter over multiple flocks may cause issues if the litter is not managed appropriately. For instance, reusing litter means that challenges for the previous flock, such as high ammonia volatilization rates, disease pressure and high moisture content, can be carried forward to the next flock. In particular, maintaining good air quality in the presence of built-up litter can be a management challenge.

The high price and decreasing availability of quality bedding materials add to the challenge of managing built-up litter. Pine shavings are an ideal bedding material, but competing markets for this product are driving the price up and making it difficult for poultry producers to afford to use it. Therefore, the industry is looking toward some alternative bedding materials such as miscanthus grass. Another possible alternative bedding material in the future could be hemp bedding. Hemp can absorb four times its weight because of its natural folding structure, and it displays high rates of both moisture adsorption (7.43 mg/min) and moisture release (12.5 mg/min); however, hemp is more expensive than pine shavings and lacks data, making it hard for producers to currently utilize this alternative.

Pathogen build up is another concern when using built-up litter. Typically, the optimal conditions for chickens to grow in a poultry house are the same optimal conditions for the growth of pathogens. Thus, poor built-up litter management can lead to the overgrowth of pathogens. Producers must work to keep pathogen numbers below a disease pressure threshold that the flock can tolerate.

MOISTURE CONTENT

Moisture is a key factor influencing litter quality in broiler houses. Litter moisture is affected by multiple factors including the broiler house environment (temperature, ventilation rate and humidity) and litter properties (bedding material, new vs. built-up litter, litter depth and moisture content). Poor litter moisture control can cause severe footpad dermatitis (Figure 1) (Shepherd and Fairchild, 2010), which affects the performance and animal welfare of chickens. Previous studies recommend an upper threshold of 25 percent moisture litter moisture (Fairchild and Czarick, 2011). Levels higher

than 25 percent also increase the ammonia concentration in poultry houses, which can affect bird health and welfare. Maintaining litter moisture concentrations below 25 percent is not always possible especially during wither weather.

Determining exactly how much moisture is in broiler litter requires some laboratory assistance. Litter samples are collected from various locations in the poultry house, and a composite sample is sent to the lab for analysis. There, they first weigh the poultry litter as is. Then, the litter goes through a drying process, typically 24 hours. After the drying process, the poultry litter is weighed again, and the weight reduction is going to be the water content loss. From that, they can calculate the litter moisture content.

An alternative way to assess litter moisture is a rule of thumb described by Michael Czarick (Czarick, 2007) that performed by squeezing handful of litter firmly:

- If the litter stays in a ball, it is too wet.
- If the litter sticks together slightly, the moisture content is acceptable.
- If the litter does not stick together at all, it is too dry.

Growers should check the moisture content regularly. By reusing the poultry litter from the previous flock to the next flock, the moisture content in the litter will be added to daily by the birds through respiration and manure deposition. To compensate for this increase in moisture, ventilation rates must be properly maintained, especially during winter.

"NO ANTIBIOTICS EVER" PRODUCTION

No Antibiotics Ever (NAE) production requires much better management (Tabler et al., 2019); however, NAE often shows that used litter may be more beneficial with NAE production. On one hand, reusing poultry litter may increase disease challenges. On the other, if producers properly manage reused litter, it will build up good microbiota which can be beneficial to our birds (Cressman et al., 2010). NAE production means your chickens do not have a protective shield from antibiotics anymore; therefore, litter management is critical. You do not want your litter to build up pathogens because your chickens are now more susceptible to infectious diseases.

Disease control and proper mortality management are two of the important management factors that producers should emphasize for NAE flocks. There has been a steep learning curve associated with removing antibiotics from poultry production. We now know that NAE production requires (Tabler et al., 2019):

- Optimum stocking density
- Good litter management
- Ideal housing environment
- Quality pre-starter feed
- Good water quality and a sound water sanitation program

WINTERTIME LITTER MANAGEMENT

Winter litter management is discussed in detail in Litter Management (Tabler et al., 2022). Some challenges in winter months are cold outside air, a brood chamber at 90-92 F for baby chicks, minimum air flow rates that make a uniform temperature distribution difficult to achieve and expensive propane that producers must burn to keep their flocks warm.

During wintertime, producers must balance between the expense of heat loss and ventilation to remove ammonia and moisture. Failure to balance heat loss and ventilation properly could mean:

- High NH_3 concentrations
- Increased pathogen growth/disease challenge
- High litter moisture concentrations

Moisture is the key factor influencing litter quality during winter. There are two major sources where this moisture comes from: The first one is the birds. Birds consume approximately two pounds of water for each pound of feed consumed.

Eighty percent of this water is added back to the house environment in the form of manure and respiration. Second is the brooders. For each gallon of propane burned, 6.8 pounds (0.8 gallons) of water is produced. Producers must control this moisture with ventilation, and the amount of ventilation needed will vary continuously. The ventilation rate needs are necessary to ideally keep ammonia at less than 25 ppm and maintain relative humidity in the 50-70 percent range (Tabler et al., 2020).

PATHOGEN CONTROL

During wintertime, litter pathogen concentrations tend to increase when ammonia and moisture control is poor. To address this problem, some common methods are:

- Pasteurization — uses heat to kill microbial disease organisms
- Composting — well-known and commonly used method
- Windrowing — reliable and cost-effective way to reduce pathogen load
    - It is not true composting because composting takes a longer time
    - Heat buildup in windrows can kill the majority of pathogens.

Windrowing (Barker et al., 2013) is an attractive litter management practice that is a reliable and cost-effective way to reduce the pathogen load in built-up litter. It is not true composting because the windrows are in place for only a short time between grow outs, but when done correctly heat buildup in the windrows will kill many microbial pathogens.

Windrowing can be challenging to manage (Figure 2) (Hawkins et al., 2010). For instance, litter moisture must be adequate (25-30 percent), or the windrow will not heat properly. If the windrow doesn't heat, the windrowing process has done little good, and time and diesel fuel are wasted. There also must be enough downtime between flocks to windrow properly.

Given enough time to do it correctly, and with the right moisture content for the windrow to heat to around 130-140 F, many of the pathogens in the litter can be killed. Depending on the litter moisture content, it may be necessary to leave the caked litter in place to have enough moisture to make the windrow heat. Consult your service technician about leaving or removing the caked litter before windrowing. The initial windrow should be built within two days following flock departure and allowed to remain windrowed for three days. Then, turn the first windrow and create a second windrow that will similarly remain in place for three days. After three days, level the second windrow. Allow the litter 3-4 days to dry and cool after the windrows have been re-spread before applying a litter amendment. Otherwise, the amount of ammonia emitted by the litter can rapidly overwhelm the litter amendment, rendering it ineffective. Litter over 6 inches deep is difficult to windrow because of the amount of material in the house. Windrowing works best at litter depths of 3-6 inches.

LITTER TREATMENTS

There must also be enough downtime between flocks to windrow properly. Less than 10 days is not long enough to properly windrow litter. Especially after applying windrowing, it is important to use litter treatments to manage ammonia levels. Some litter amendments can also reduce pathogen loads built up in used litter. However, some amendments can increase the nitrogen (N) content in the litter, and the conversion of nitrogen (N) compounds in manure to NH_3 is a source of environmental concern. Ammonia is a serious animal welfare and economic threat to the poultry industry and must be managed as such. Most litter treatments are acidifiers, and growers should follow manufacturers' recommendations, guidelines and precautions for their safe use and handling. Commonly available litter treatments include:

- PLT (sodium bisulfate)
- Alum (aluminum sulfate)
- Poultry Guard (claylike particles soaked in sulfuric acid)
- Klasp (iron sulfate)
- Liquid A7 (sulfuric acid and aluminum sulfate)

INDOOR PARAMETER ASSESSMENT

Ammonia, humidity, temperature and carbon dioxide are the critical influencing factors of poultry production and animal welfare. To properly assess these parameters, producers must acquire measurement devices such as humidity and ammonia sensors. In some cases, when growers are exposed to ammonia over a long period of time, they may not be as sensitive to noticing high levels of ammonia inside the house as others. However, these measurement devices are always considered support tools, they do not replace the role of producers in properly managing poultry farms. Nothing can work better than the human senses. Previous authors (Tabler et al., 2022) promote the "5-gallon bucket" method as the best way to assess the indoor environment of the poultry house. Basically, you find a 5-gallon bucket and sit down in the poultry house. Watch the birds. See how they respond to ideal conditions. Learn how they behave when they are too hot, too cold, etc. They can tell you what's wrong if you learn how to recognize what they are telling you. You can only learn these things by being in the chicken house. The house controller cannot grow the chickens for you. The controller can assist you, but you must grow the chickens. And the only way to do that successfully is for you to be in the chicken house.

SUMMARY

There are two take-home messages that you should always keep in mind:

- Litter moisture and ammonia control are critical to maintaining productivity and bird welfare.
- No Antibiotics Ever production has made litter management a much more critical issue.

Trade names are for educational purposes only and do not imply endorsement by the UT Institute of Agriculture or the University of Tennessee Department of Animal Science.

Fig. 1. Footpad dermatitis caused by wet litter.

Fig. 2. Windrowing litter in poultry houses.

References available upon request

Rural Energy for America Program Renewable Energy Systems and Energy Efficiency Loans and Grants

Loan guarantees for this program are streamlined under the OneRD Guarantee Loan Initiative

What does this program do?

The program provides guaranteed loan financing and grant funding to agricultural producers and rural small businesses for renewable energy systems or to make energy efficiency improvements. Agricultural producers can also apply for new energy-efficient equipment and new system loans for agricultural production and processing.

Who can apply?

- **Agricultural producers with at least 50 percent of their gross income coming from agricultural operations**
- **Small businesses in eligible rural areas**

NOTE: Agricultural producers and small businesses must have NO outstanding delinquent federal taxes, debt, judgment, or debarment.

What types of borrowers are eligible?

Eligible borrowers include:

- Rural small businesses
- Agricultural producers

Additional USDA Rural Development programs that support other types of businesses and organizations are included in the OneRD Guarantee Loan Initiative. You can learn more at this link: https://go.usa.gov/xJnfQ.

What are the borrowing restrictions for loan guarantees?

- Individual borrowers must be citizens of the United States or reside in the U.S. after being legally admitted for permanent residence.
- Private-entity borrowers must demonstrate that loan funds will remain in the U.S.

What is an eligible area?

- Businesses must be located in rural areas with populations of 50,000 or fewer. You can check our database of eligible business addresses at this link: https://go.usa.gov/xJnGQ.
- Agricultural producers can be located in rural or nonrural areas.

How can funds be used?

Funds can be used for renewable energy systems such as:

- Biomass (for example: biodiesel and ethanol, anaerobic digesters, and solid fuels)
- Geothermal for electric generation or direct use
- Hydropower below 30 megawatts
- Hydrogen
- Small and large wind generation
- Small and large solar generation
- Ocean (tidal, current, thermal) generation

Funds also can be used to buy, build, and install energy efficiency improvements such as:

- High-efficiency heating, ventilation, and air conditioning systems (HVAC)
- Insulation
- Lighting
- Cooling or refrigeration units
- Doors and windows
- Electric, solar, or gravity pumps for sprinkler pivots
- Switching from a diesel to an electric irrigation motor
- Replacement of energy-inefficient equipment

Agricultural producers can also use guaranteed loan funds to install energy efficient equipment and systems for agricultural production or processing.

USDA Rural Development
U.S. DEPARTMENT OF AGRICULTURE

OneRD Guarantee Loan Initiative:
Rural Energy for America Program
Renewable Energy and Energy Efficiency

What types of funding are available?

- Loan guarantees on loans up to 75 percent of total eligible project costs
- Grants for up to 50 percent of total eligible project costs
- Combined grant and loan guarantee funding up to 75 percent of total eligible project costs

What is the maximum amount of a loan guarantee?

The loan guarantee percentage is published yearly in a notice in the *Federal Register* (available at this link: https://www.federalregister.gov/)

How do we get started?

Applications are accepted year-round in your local USDA Rural Development office. A list of state offices is available at this link: https://go.usa.gov/xJnHR.

Who can answer questions?

Your state-based USDA Rural Development Energy Coordinator can help answer your questions. A list is available at this link: https://go.usa.gov/xtBaj - PDF.

What governs this program?

- Grants: 7 CFR 4280, Subpart B, (available at this link: https://tinyurl.com/5e8vy9sb)
- Guaranteed Loans: 7 CFR 5001, (available at this link: https://tinyurl.com/3rt4cp59)
- This program is authorized by Title IX of the Agricultural Improvement Act of 2018 (available at this link: https://tinyurl.com/3hn26vy3), and the Inflation Reduction Act of 2022 (available at this link: https://tinyurl.com/26cv2tzc).

Why does USDA Rural Development do this?

This program helps increase American energy independence by increasing the private-sector supply of renewable energy, and by decreasing the demand for energy through energy efficiency improvements. Over time, these investments can also help lower the cost of energy costs for small businesses and agricultural producers.

NOTE: Because information changes, always consult official program instructions or contact your local Rural Development office for help. A list is available at this link: https://go.usa.gov/xJHPE. You will find additional resources, forms, and program information at https://rd.usda.gov. USDA is an equal opportunity provider, employer, and lender.

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