**NE-1442 Annual Meeting:**

**Poultry Production Systems and Well-being: Sustainability for Tomorrow**

**Daft Minutes**

July 30-August 1, 2017

USDA-ARS, and the University of Georgia

Athens, GA

**Monday, July 31, 2017**

The meeting was called to order by Dr. Anup Kollanoor Johny at 8:40 am.

**Introduction of Participants:**

Mike Darre – UConn – Extension – all birds, environmental physiology, since 1975

Anup Kollanoor Johny – U of Minn. Food safety, microbiology.

Ken Koelkebeck – U of Illinois - mgmt., layers, lbroilers, molting since 1987.

Tom Vukina – NC State Economics, since 2016

Tony Pescatore – KY, Nutrition and Mgmt

Roger Sunde U of Wisc. - molecular biology, bio markers, nutrients,

Neil O’Sullivan - Hy Line Genetics, industry interface, behavior and new environments

Yang Zhao Miss State. env mgmt. air quality, diseases automation in broiler

Tayo (Sunday) Adedokun – Kentucky

Jean Guard - USDA ARS vet med officer, salmonella,

Oscar Garrison – UEP

Taylor Rodgers - UEP intern

Rich Gates - U of Ill. Ag Engineer

Jody Purswell - USDA ARS Miss. Ag Engineer

John Linhoss - Miss State env mgment, lighting, etc

Dianna Bourassa – Auburn – processing, food safety

Gabriella Furo - U of Minn Foot pad dermatitis

Mike Persia - Va Tech nutrition, broiler gut health

Kelly Wamsley - Miss State nutrtion, broilers feed quality. Since 2012

Woo Kim - UGA nutrition

Marisa Erasmus - Purdue

Janice Swanson – Michigan State Univ. behavior

Douglas Cosby – USDA - ARS

Richard Daven - USDA - ARS SE work.egg contaminate

Manfried Singh - USDA – ARS food micro

Harshavardhan Thippareddi - UGA 2016

Deana Jones USDA- ARS egg safety previous projects

Mike R. USDA- ARS small flock, etc

Ken Anderson – NC State Extension, layers, etc

Ken Macklin – Auburn Nutrition

Casey Ritz – UGA extension, broiler and env waste mgmt.

Michael Rothrock – USDA-ARS Small flock mgmt..

**Start of Business**

Ken Koelkebeck asked for a motion to approve the minutes of the 2016 meeting in Bern,

Switzerland. Ken Anderson moved and Mike Persia second. Minutes were approved by unanimous vote.

Ken K. then discussed the history of the project which started as Poultry Physiology and Engineering, as a NE regional project. It has expanded over the years to a more national scope which then included nutrition, economics, behavior, food safety, etc. This is normally a five year project with potential for renewal. Our new project must be submitted by March 2019, but we must submit an intention to renew by September 2018. We have a short meeting in Atlanta in Jan each year to discuss how we are doing with collaborative research, grants, and planning for the next full meeting.

**Welcome to UGA**

Sam Perdue - Academic Dean CAES – UGA Welcome to GA. A lot of people named Perdue in GA. UGA is one of six remaining poultry science depts. In USA. He is excited about the future, especially with plans for new Poultry Department building. The U.S. Farm bill is still a work in progress. Hopefully it will work out to benefit the industry and research. Food safety is very important now, maybe more than ever. This generation may not have the same understanding of food safety as previous generations. Colleges of Ag are facing new challenges. New students are more interested in where their food comes from and how their food is processe than past generations. We as the industry must do better at educating the consumers to the reality of food production. Sam stated that if he makes it to 2050 the population will triple from when he started. We must have a safe and economical food supply. Steve Troxler, Ag Commissioner from NC said “hungry people are mean people”. Let’s not make people mean.

Todd Appplegate, Head, dept of PS UGA. Todd started with a brief history of poultry in GA. He said that there was not much prior to 1920, however the boll weevil came and destroyed the cotton industry. South GA moved to growing tobacco. Jesse Jewell, who owned a feed mill, started giving chicks to farmers to grow, one of the fist integrators, with a feed mill, hatchery, and processing plant. Poultry is about 47% of Ag in GA. It is a $35 to $50 Billion industry. It generates a $3.5 to $3.8 billion tax base in GA. GA has 102 counties producing more than $1 million in poultry products. If GA was a country it would be 7th in world producing 2,634 metric tons per year. About 1.4 billion birds are raised each year in GA. The Port of Savannah is a large port with a lot of international shipping.

The UGA Dept. of Poultry Science has 6.7 Research, 4.2 Instruction and 7.7 Extension FTE. Focusing on four areas: Safeguarding and Sustaining the world; Production and Mgmt. Systems; Bird Physiology, Metabolism, omics; and Bird health and well-being. They will be adding some new faculty in the future. The dept. received $5 m in capital for poultry farm renovations. Classroom and processing building renovations are also scheduled, including adding a BSL2 facility. UGA currently has 10 animal buildings on the poultry farm.

The poultry science program has four majors; Poultry Science, Avian biology, Animal Health and Biological Science. Have about 45 Poultry Science graduate students. They have a vet PDRC with about 11 people.

Ken K. asked how they handle the farm budget. Todd said now they charge a per-diem of 1 cents per sqaure foot per day.

Rakesh K. Singh- Food science dept. head also welcomed the group. He noted that they have two locations, One in Griffin, with about 11 faculty and one in Athens. A lot of food safety work. In 1888, the Georgia Experiment Station was established to carry out agricultural research for the University of Georgia.  Located in Griffin, Georgia – 40 miles south of Atlanta – the University of Georgia-Griffin Campus now includes both graduate and undergraduate programs in agriculture and other areas of study.

The Food Process Research and Development Laboratory (FPRDL**)** in Athens, GA provides facilities and expertise for developing new products and for testing new processing technologies.

The Department of Food Science and Technology at the Griffin campus is located in the Melton building – which houses offices and research labs for faculty in the Department of Food Science and Technology and the UGA Center for Food Safety. They have both undergrad and grad students, and some extension faculty. They focus on processing and microbiology.

Tony asked how cooperation between Griffin and Athens works out. Rakesh said all food safety went to Griffin first and grew. Now both work well.

**Administrative updates** from Cameron Faustman. Nothing new to share. Will have someone to replace him as administrator. He noted that there is no more requirement for a 25% match for the USDA Challenge grants for teaching. These challenge grants are not as competitive as others, may be easier to get some funding. There are some changes at NIMMS site. Ruby Maize is no longer with them. David Liebowitz is now the contact about renewal of project. Request to renew is due by Sept 2018 and the final project proposal is due by March 2019. There was some discussion of the fact that we are a NE project and Mike Darre is retiring. How will this affect the NE designation? PA is the only other NE state still active in the project. Maybe we should become a North Central project? It was suggested that we all meet with our own experiment station directors to discuss this issue. We should also meet early with whomever they appoint as our new project advisor.

**NE-1442 Current Situation –** Ken Koelkebeck

If you did not submit a paragraph or two to Anup earlier, or need to amend or change them, then send a paragraph and list of publications by Sept. 22, 2017 to Ken K. We need to produce a full annual report also. Mike Darre will send out format instructions for the annual report. Each station needs to do a full station report sent to Ken Koelkebeck by March 1. Next year’s meeting will be at Purdue in Indiana. The week of Aug 6-10 works with our preference being Aug 9-10, but any time that week will work. We will await to see what Darren Karcher can do.

Break at 10:30 am

**Research Needs from Industry Personnel**

Oscar Garrison – UEP Vice President for food safety/regulatory affairs. Currently there is a pesticide contamination in eggs in Netherlands, do egg products reach the USA?

What does UEP do?

We started as a National Farmer Coop in1968. About 95% of total US poultry egg production. (More than 300 million hens) are UEP members. Most of the lobbying for the layer industry is done by UEP. There are about 147 companies represented. The professional staff is down to 4 plus 1. What will the US layer industry look like in the future? There has been a lot of consolidation in past 20 years and it looks to be continuing. Now there are 60 companies that have more that 1 million layers and 17 with 5 million or more. Some of the challenges are that is not easy to start fresh with a farm, easier to purchase existing land and facilities and to consolidate the farms. Currently only 4.7% of US produced eggs are exported. Cage free is a focus right now. Housing is important. How do we transition to cage free systems? Other issues are FSMA, Organic Rule, CERCLA/EPCRA, **Biosecurity**, and survival in general. (Price and supply.) FSMA says farm is exempt, but what is a farm? Egg farmers have the egg safety rule, but really want a risk based approach, but the regulators not there yet.

What caused the 2015 AI outbreak? Some high biosecurity farms broke but some without good biosecurity did not. Why? People to people contact from different farms? How do we prevent the people to people contact?

Some producers still feel that conventional cage systems will survive and others are moving to cage free systems. Right now 232 grocery stores and food companies have committed to cage-free eggs by 2025. It will take 228 million layers to be cage free by 2025 to meet commitment if all the companies still want cage free eggs. This is almost impossible to meet that timeline.

It will cost about $10 billion to convert to cage-free farms. Only 7 years to get to 228 million layers cage free. How? Current cage free is 14.2% in 2016, or 44 million birds. Many of the commitments say if eggs available, if consumers want. However, the special interest groups are pressuring customers of poultry farms. UEP is trying to strengthen and amplify cage, enriched colony and cage free. Should we include enriched colony in UEP certified program? The UEP is now Partnering with the World Wildlife fund for a sustainability study. Currently there are 5 types of cage free housing systems, so how do we really define cage free? MA went to 1.5 sq ft per bird, cage free. CA at 1.16, and RI, MI all with different regulations. All pushed by HSUS. (See UEP statement on cage free definition/guidelines) Will there be a market for caged eggs by 2025? Conventional cages cost about $15 per hen, enriched colony cages about $25 per hen. Cage free is about $40 per bird. UEP supports all three production systems. Specialty eggs are not supported by the WIC program in many states, so 58% of recipients will not be able to purchase cage free eggs at current prices. Right now there is a surplus of cage free eggs and they are being dumped on the conventional egg market at a loss.

Research Issues from UEP perspective:

Animal welfare issues will be the problems in the future. Worms in eggs have been reported now with cage-free, free range, etc. birds. Other issues are emerging pathogens, pesticides (7 farms in Netherlands with issues), and free range vs cage free. Training periods for pullets, doors to outside? Also there are labor issues. Human trafficking is an issue for depopulation crews. Finding workers for the industry with poultry skills and knowledge/education will be a major issue in the future.

Discussion: How do we deal with small flock people with eggs for sale in commercial producer cartons that do not have the names, dates, etc. crossed out? How do we deal with the extra males from hatcheries by 2020? Food safety testing that regulators do not have access to, such as smaller flocks. There is a need for third party labs to independently test eggs without having to report to USDA or FDA if things are found that are not currently listed as hazards. What about new SE serotypes? Need to get ahead of the curve on the pathogen issues.

**Multi Institutional Grants:**

Cathy Cuppett and Jake Maas from the UGA sponsored projects and proposal enhancement.

Jake provided five key dynamics for effective teams (from a google study) Meaning of work, Impact of work, psychological safety (can we take risks on this team without feeling insecure or embarrassed?) Dependability, Structure and Clarity. Who is on the team is very important.

When do RFA’s come out from NIFA? Depends on need, funding, etc. You have about 10-12 weeks to get the proposal completed. Find previous proposals that were funded to review. Check the CRIS site for these. Identify collaborators, review the NIFA application guide, but check the RFA, talk to program officer, develop check list, timeline, (one by Jake will be sent to all), summary and abstract. Go to [www.research.uga.edu/proposal/enhancement](http://www.research.uga.edu/proposal/enhancement) for templates.

Neil O’Sullivan – Hy-Line. Is the Global director of R&D for Hy-Line. Their main focus is on genetics of breeders for laying hens. He said that about 15% of eggs are currently from cage-free production. Producers look at their current footprint to change from conventional cage to cage free systems. That way they avoid some of the zoning issues. Feather cover is an issue with the birds in aviary systems. Fast feathering and re-feathering is important. Feather cover is directly related to feed conversion ratios. Three is some pressure in Brown egg birds because without feathers the birds get more UV to skin and more vitamin D production that suppresses the porphyrin pigments for brown egg shells and we end up with lighter brown eggs. Leghorns learn to use nests fast, browns do not. Browns are more sensitive to light intensity and want dark areas like a nest box to make a nest in the litter. Catastrophic floor eggs is when the calls come in to them asking why and what can be done to reduce them. Hy-Line is selecting for nesting behavior now. High exploratory behavior birds do well in cages and go to aviary systems without much problem. Browns do not do well starting in cages. Browns also need slightly higher brooding temps, about 2oC more than whites. Foot scores are a challenge for leghorn hens. Keel condition is also an issue. This is mostly an environmental and nutritional component. Keel fractures are tough, need good imaging to detect them. For meat birds, the so called consumer push is for slow growth birds. One of the problems here is how we select for slow weight gain while keeping feed efficiency. People are putting hens out in pastures, not forests, and expecting them to act like it is the natural setting for chickens. Unfortunately pastoral scenes for chickens are what the consumer is being given and have come to expect.

Salmonella is also an issue. There is no such thing as exotic salmonella. Any strain of salmonella is not accepted by the breeders. There is about 5% better egg production in clean and disinfected layer houses. So clean between flocks. We need to be pro-active in this area of biosecurity. Must stress test your biosecurity – ask the right questions of the workers such as: “Are you having an affair with someone from another farm? Worker safety is also an issue.

Lighting is an issue. Fluorescent lamps are too discrete in their spectral quality. Chicks and pullets should have some blue light in the spectrum while adults should have red.

Blood chemistry is important. What are the normal ranges? Now we are looking at diagnostic systems. We need to measure blood oxygen levels and select for higher levels. This was done in broiler breeders in selecting against ascities and may need to be selected for in layers.

Chick sexing is also a point of emphasis. McGill University work is not proven in the field. Rahman spectroscopy from Germany has been used to determine if male, ZZ chromozomes are denser which changes the spectrum of 4 day embryos. Testing is being done in the pedigree hatchery. We in the industry must never lose sight of the fact that poultry protein is one of the most sustainable food sources.

Discussion: What about the microbiome of poultry? Hy-Line is looking at this, but needs more computing power to analyze this. What about heavy metals found in eggs, from backyard flocks.

**Other Business and Group Sessions on Current Objectives:**

We had some further discussion of dates of next meeting in Purdue. Earlier August (PSA is July 23-26) would be good. Sometime during the week of Aug 6-10, however the preference is for Aug 9-10, but any time will work. On Jan 31, 2018 2-3 pm at IPPE will be the next short meeting of the committee do generally see how things are going and finalize plans for the August meeting.

We need to appoint a nominating committee to select people to fill the following positions: Senior Executive, Junior Executive, Secretary, Host or chair. Sr. Exec. Runs the meeting, Junior exec. helps and covers for Sr. Ex. Secretary keeps minutes of all the meetings. The nominating committee was appointed as follows: Ken Koelkebeck, Tony Pescatore, Ken Anderson, Mike Persia. They will report back tomorrow morning with their nominations.

Re-write time line: Request to submit is no more than 20,000 characters and must be received in either Sept 2018 or March 2019. Tony moved and Deana seconded that we work on the rewrite request at the 2018 meeting in August and submit for the September 2018 deadline. Motion carried. Completed project would be due by Nov 2018 or April 2019.

**Group discussions of current objectives:**

**Objective 1.** Energy/resource efficiency (Input resource efficiency for sustainability)  
  
This will include shared efforts on feed and fuel energy sources for poultry and facilities by geographical region; facility design, equipment efficiency, management, and modeling energy use in poultry systems.

New Name – Input and Resource Efficiency for Sustainability

Big Questions – Evaporative Pad, Lighting, slow growing broilers

* Evaluate alternative construction practices and effects on resource use; Evaporative pad/Water use; Lighting; Slow growing broilers; Automation technology (input technology includes labor); Feed vs fuel costs; Efficiency of birds ability to metabolize carbohydrates

People

* Jeremiah Davis,,Yang Zhao,Rich Gates, Hongwei Xin, Tony Pescatore, Mike Darre, John Linhoss, Angela Green, Yi Liang, Hong Li
* Schools: Auburn, MSU, ARS, U of I, UK, UConn, Arkansas, Delaware, ISU

Resources

* USDA Fans Unit; USDA Environmental Chambers; Power Analyzers; Thermal Cameras; Radiant Flux Sensor Sampling System; Goniometer; Bess Labs; Ammonia samplers, CO2 samplers; MEEL trailer; Preference Chambers

Project

* Example: Broiler and Layer chicks preference for radiant vs floor heat

Teams

* Example: MSU, ARS, U of I – radiant vs floor heat

**Objective 2.** Evaluating commercial poultry production systems   
This will include joint efforts on the characterization of the performance of conventional, alternative, and organic poultry production systems relative to air and water quality, nutrient management, acoustic environment, and animal health and welfare. (Joint effort characterizing performance of conventional and alternative poultry production systems relative to air and water quality, nutrient management and bird welfare.

New Name: Evaluating poultry production and processing systems.

NE-1442 Working Group 2 Objective

Objective: Evaluating Commercial Poultry Production Systems

Committee People: K. Koelkebeck

Casey Ritz

Michael Rothrock

Ken Macklin

Dianna Bourassa

Potential Collaborators: Most every experiment station

Facilities: Extension type studies at commercial and small flock facilities. Facilities at IL, NCSU, ISU, etc. to examine the areas of environmental quality, nutrient management, bird welfare, food safety and quality

Projects:

1. Revise the current NRCS Water Quality Handbook. Casey Ritz has been given a grant to revise this booklet. This would be a joint effort from all experiment stations that choose to participate. It would require the review of the current material in the book and updating items in the book and potentially add additional items.

Poultry Water Quality Handbook – 3rd edition expanded Draft – February 2004

\*Highlighted text indicates suggested revision, addition/deletion, or movement within the contents.

**Water Quality ~~Issues~~**

Introducing the Poultry Industry – It’s Environmental Issues and Impacts

What is water quality?

Poultry production and water quality

Understanding water quality regulations

Drinking water quality – protecting your birds’ health and performance (retain topic? Handbook relevance?)

Controlling struvite buildups (retain topic? Handbook relevance?)

*Additional topics needed (?)*

Agricultural Water Usage

On-farm Storm Water Management

Processing Waste Water and Storm Water Management

**Poultry Waste Management**

Environmental impacts of poultry waste

CAFO requirements

Planning poultry waste management

Optimizing nutrient utilization for a better environment

Dry waste management

Liquid waste management

Composting waste products

Putting nutrient management to work

Economics of transporting poultry manure and litter

Feeding litter to beef cattle (retain topic? Handbook relevance?)

Horticultural uses of composted litter

*Additional topics needed (?)*

Poultry Mortality Management

An overview of poultry mortality management

Composting – a disposal method for dead birds

Incineration – a disposal method for dead birds

~~New takes on~~ the rendering process – refrigeration

~~New preservation technology –~~ fermentation and acid preservation

Humane methods for dealing with spent hens

Developing alternative markets for poultry mortality

*Additional topics needed (?)*

*Hatchery Waste and By-product Chicks*

**Soils and Land Application of Manures**

Constructed wetlands

*Additional topics needed (?)*

~~Other Environmental Issues~~ **Air Quality and Odor Management**

Site selection for the poultry homestead

The benefits of planting trees around the poultry homestead – Vegetative Buffers

Air quality and its management

Using regulations as management principles

Controlling odors – multiple purpose management

*Additional topics needed (?)*

Neighbor relations

Zoning issues and their impacts on the industry and communities

Greenhouse gas emissions

**Poultry Farmstead Pest Control**

Preventing fires in manure/litter storage structures

Protection against pests, predators, and darkling beetles

Protection against pests – controlling flies

*Additional topics needed (?)*

***Energy Conservation***

Using litter to generate heat and electricity

*Additional topics needed (?)*

Energy conservation practices and immerging technologies

Alternative Technologies

Alternative bedding – select materials may have hidden values (retain topic? Handbook relevance?)

*Additional topics needed (?)*

Resource Information (contact information listed for the various agencies and personnel)

Poultry water quality consortium

U.S. Poultry and Egg Association

USDA Natural Resources Conservation Service

Tennessee Valley Authority

U.S. Environmental Protection Agency

Directory of Poultry Associations: State, Regional, and National

Other Supporting USDA Agencies

Directory of State Water Quality Agencies

1. Acoustic Research: This type of research is being conducted at Georgia Tech in cooperation with Karen Christensen at the University of Arkansas. This group thinks that it would be advisable to see if the faculty person at Georgia Tech and Karen Christensen would want to join the project. Perhaps see if Peter Scheifele at University of Cincinnati would be interested.

**Objective 3.** Establishing parameters influenced by the production system and strains utilized within the poultry industry.   
  
This collaborative research will encompass the areas of poultry nutrition, physiology, behavior, well-being, food safety and quality, and economic evaluation of poultry production systems.

Discussion – Systems approach and strains – still applicable

Research collaboration – NIFA – not sure

National organic grants – RFP December, March due date

* Darrin –
  + Revisit synthetic methionine production and environmental impact – need to get together a prelim grant ($50,000) to plan for big $2.5 project – synthetic methionine goes into effect in 2021? – this sunset timing is important to consider
    - in previous project – Cherry Hill farm collaboration
    - for this probably need to focus
    - initial – research facility – if recruiting grant, then developing relationships with industry partners to take the end of the research to a commercial farm
    - THIS YEAR $50,000 planning great – research plan, infrastructure, outcomes, if need data – opportunity to do small pilot to generate data - needs to be solid enough so that they know intent is to apply the following fiscal year
      * Outcome measures: if 1-2 stakeholders, then outcome would be stakeholder advisory committee would consist of… - then need letter.; recruitment of people to test certain ideas – then need letter; pilot study – could be data even if not organic to prove a point (like with high protein)
  + Ken A - nematode parasites and options to mitigate (regional - $500,000)
    - turkey associated parasites – need to relate to chickens now
* We need a vet on committee:
* Mike Persia suggested Bill Pierson
* Deana Jone suggested Yuko Sato at Iowa
* Ken Anderson suggested Mike Martin

Action Item - Darrin – head up planning grant for National Organic Grants – Layers and synthetic methionine

We need to develop a list of names of interested parties

* Research question: synthetic methionine overfeeding protein as lack of use and impact of environment of bird – egg quality/safety, behavior (not getting all AA),
  + Birds organic – more aggressive, no enrichment, feather loss
  + Get involvement of mobile hut, etc
* Facilities – concentrate on organic facilities – and getting together the collaborators for the organic facilities
  + Buy in from organic nutritionists – different philosophies on diets
* Get a wildlife person involved
* Vet involved
* Ken has entomologist

Neil – is it possible we are overfeeding due to high protein diets (due to overestimation from NRC and breeder guidelines)?

* Persia – crude protein levels are lower but with synthetic AA we are able to be more precise and feed lower CP.
* Ken A – nutrient partitioning very different and significant overestimation on what birds are getting from range; nutrient utilization differences are also due to microflora; these alternative ingredients are pretty close to meat meal – where can we get methionine and how can we concentrate it?
  + Small producers feed one diet and never change; whereas larger producers do change diets.
  + Nutritional affect (1940s diet vs current diet)
    - Persia run dexa on this project
* Gut length ranges – birds underproducing – deficient of length of gut – never looked if bird is always that decreased in gut length
  + Feeds, gut biome – affecting gut length
  + Gut length heritable trait
* KA – AVIARY – meeting with company
* Deana – BSLII facilities for cage –free (floor);
* MS state BSLII facilities (new); a-frame layers, enriched caged layers; raised wire cages; processing; 5 floor pen facilities (broilers) – 1 newly renovated; 2 conventional houses
* What ages can you optimize moving to cage-free; considering strain
* Michigan – increase aviaries (donate or buy)
* VT – 2 conventional meat bird; BSL II facilities; free access to DEXA; petersime cages; a-frame layers
* Kentucky – (no new) conventional laying; floor pen broiler; raised wire cages

Broiler breeder programs – skip a day feeding

Enrichment in housing for broilers, etc

***Rewrite Teams:***

Objective 1. John Linhoss, Jody Purswell, Rich Gates, Yang Zhao, Mike Darre, Tony Pescatore

Objective 2. K. Koelkebeck, Casey Ritz, Michael Rothrock, Ken Macklin, Dianna Bourassa

Objective 3. Deena Jone, Darrin Karcher, Ken Anderson, Marisa Erasmus, Janice Swanson, Mike Persia, Kelly Walmsley, Neil O-Sullivan, Roger Sunde, Tayo Adedokun

Session Adjourned at 4:50 pm. The group met for dinner at Logan’s Roadhouse.

**Tuesday, August 1, 2017**

Meeting was called to order at 8:32 am by Anup Kollanoor Johny.

Nominating Committee Report:

New Sr. Exec: Kelly Walmsley

New Jr. Exec: John Linhoss

New Secretary: Dianna Bourassa

Host for 2018 Darrin Karcher and Marissa Erasmus – Purdue Univeristy

Station Reports: 4 min for presentation and 1 min for discussion

Roger Sunde – WI Rodent and molecular biologist. High Selenium requirement in rodents. Works with Turkey also. Found 24 seminal proteins for Se. Did work with turkeys with Arsenic and Selenium. Analysis of Se concentration in thigh, breast, kidney and liver in poults, as well as selenoprotein enzyme activities and mRNA levels, suggests that NRC chicken requirement for poults should be raised to 0.4 μg Se/g. Need about .15 to .2 ug for broiler chicks and .4 for Se for turkeys. Working to find better bio-markers for when too much mineral is in diet. Used inorganic Se. Met deficient with seleno-met and did not help Se level.

Ken Koelkebeck – IL Strudied Hybrid Turkeys at CO2 levels of 2000, 4000, and 6000 ppm in air. Looked at bw, mortality and behavior. Body weight gain at day 21 was greater for poults at 2000 ppm compared to the higher concentrations, however no significant statistical difference was observed. This preliminary (first and second replication) study showed that the tested concentrations of CO2 were not a strong contributing factor to reduced turkey performance in the initial phase of rearing.

Ken Anderson – NCSU 40th layer test had 18 strains of birds, 5 environments (cage to cage free to free range) with 15,000 birds total. Still working on ventilation shut down (VSD) studies, VSD plus heat and/or CO2. VSD plus heat works well. Mostly working on current objectives 2 and 3. Comparing 1940’s leghorn diets to modern and comparable diets for type of bird, and looking at microbiome. Ken will be going to Ethiopia to help get flocks to better utilize nutrients.

Tom Vukina – NCSU Tom is looking at substitution and price of organic eggs. Excess organinc eggs get sold with non-organic eggs at a loss in price. A lot more space is required for Organic layer, thus fewer birds per unit space and higher cost of production per bird. We will have a supply shift due to loss of organic eggs from producers going to just cage-free. Looking at data sets from USDA pricing and sales. A small change can affect overall price.

Ken Macklin – Auburn Lots of projects at Auburn. Jeremiah in engineering is looking at heater systems through the National Poultry Technology Center(NPTC). Dianna has three ongoing projects. One is looking as different methods of stunning, such as CO2 and electrical stunning. She is comparing the stunning method and EEG, so far it is better to use higher voltage, such as 110 vs 60 volts for a better stun. Another project is with Buffered Neutralized peptone water. It is being tested in plants to see if it works in the field. The study is to determine the efficacy of neutralizing buffered peptone water (BPW) compared to standard BPW on whole carcass rinse microbiology. It was determined that for Enterobacteriaceae, neutralization was necessary to prevent residual antimicrobial action. No differences were detected in Salmonella prevalence. However, the detection of Campylobacter may be hindered by the use of neutralizing BPW. Some agents may be depressing campylobactor. Another area if research is the impact of feed withdrawal/catching on broiler respiratory tract microbiology. Catching (and the inherent dust produced during catching) does not appear to impact anaerobic plate count, Enterobacteriaceae counts/prevalence, or Salmonella prevalence. There is also some extension work at feed mills to make sure no food borne pathogens are in the mills and transferred to the feed. Joe Hess is doing more small flock management and food safety work. Ken is working on objective 2. Salmonella infections and where it colonizes, so far the ceaca seems to be the best area. They are also studying some probiotic and looking at litter management and microflora, with litter treatments to control ammonia.

John Linhoss – Miss State Working on insulation in new and old houses and heat efficiency. Radiate heaters are putting only about 40% of heat to floor. He is testing new measurement devices for determining efficiency of these heater systems. Research projects on bird behavior and preference for radiant heat during brooding and building envelope thermal performance for new and aging broiler houses were also completed and the manuscripts are currently being prepared for publication. There is great room for improvement in brooder heating. He is also looking at fan shades to decrease incoming sunlight intensity. Good shade will show up to a 10 fold decrease in intensity in the building.

Kelly Wamsley Miss State She is focusing on DGS in diets of broilers. She has found that up to 8% low fat DGS inclusion is ok. Also looking at Zn in broilers. Some research is being done on Xylanase and NSP enzymes and their cost. Data demonstrated an economic benefit for feeding diets formulated with an enzyme primarily providing xylanase, as opposed to a diet formulated with a multi-carbohydrase enzyme. Another area of interest is amino acid requirements of Cobb birds. Feed particle size in broilers is also of concern. Data demonstrated a benefit for feeding >1760 and 2257-micron crumbles, though more research is necessary to determine if overall crumbles size or the SD associated with the crumble particle size has a greatest influence on bird performance in the starter period.

Janice Swanson, Janice Sigford, and Darren Karcher Mich State. One of their projects is resource use of brown vs white layers in aviary system. They are currently using the Big Dutchman system and looking at perch use. Whites go higher and crowd more while the Brown birds stay lower in the system. Browns lay outside of nest more and whites use the nest more. Whites also do more wing flapping. It is recommend that a minimum of 15 cm perch space per bird is needed. They are working primarily on objectives 2 and 3. Janice Swanson said that they currently have an Extension (70%) and teaching (30) position available at MSU. On Jan 22, 2018 a new Department Head will be arriving as Janice is stepping down.

Tony Pescatore and Tayo Adedokun KY ME of diets of corn and wheat midds was studied. Diet matrix changes this. Drying method did not affect ME. High Na resulted in increased N excretion. It was found that one can feed organic minerals with less of them excreted. Chicks fed with organic Zn had better tibial length. They are working on objective 3 and pasture systems for meat production. Three weeks inside then outside works pretty well. With pasture systems they found much slower growth with heritage birds. Breeds on pasture have more off flavors, more in females than males. This sex difference was also evident with chicken flavor with females having a stronger chicken flavor. Broilers used alfalfa pasture as bedding and heritage birds ate it.

Mike Persia VaTech Focusing on broiler models and antibiotic replacement, such as buterate, which helps with feed efficiency. He is also looking into other feed additives and natural products. With Laying hens he is looking at distillers oil vs other vegetable blends. Both DDGS derived corn oil and soybean oil were evaluated in growing broiler chicks at both commercial and higher dietary Ca concentrations. Overall the AMEn values of both oils were reduced by the high Ca diets, but corn oil AMEn was reduced at a greater rate when high concentrations of dietary Ca were present. This might indicate that corn oil would be a less available source of energy in laying hen diets that contain higher concentrations of dietary Ca. Another experiment was completed to understand the effects of feeding hulless barley to growing broiler chickens. This research quantified the nutritional value of the barley and also explored additional value of feeding the small barley grains in a whole form to reduce the cost of grain processing and to explore potential benefits from a gut health standpoint. Results indicate that hulless barley does have appreciable nutrients and can be fed to growing broiler chickens, but it appears that the hull (fiber) is involved with the development of a larger gizzard associated with the feeding of intact small grains in poultry.

Anup and Gabi U of Min The effect of rearing conditions on footpad dermatitis (FPD) in hen and tom turkeys using a combination of controlled research pen studies and by conducting observations on commercial farms were undertaken. For older turkeys, there was a positive significant correlation of the live score with the post mortem scores. In both studies, there was a shift toward a more severe score with the post-mortem sample.

A comprehensive project determining the potential of antibiotic alternatives to control multidrug resistant (MDR) Salmonella Heidelberg in turkeys was undertaken. Probiotics, prebiotics, and vaccination were tested individually and in combination in 2-week, 7-week, and 12-week old turkeys challenged with MDR S. Heidelberg. Microbiome analysis was also conducted.

Darren Karcher Purdue Pullet molt study. Can we delay pullets from laying too soon. A pullet molt study was conducted to evaluate the impact of an early production molt as a way to extend pullet-stay in the grower house in an event of disease outbreak. Results indicated that hens that were molted did not completely cease egg production, but molting hens at 10% production may prove advantageous to maintain pullets for a longer period of time in the pullet house during a disease quarantine scenario, resulting in sufficient egg production post-molt with little impact on egg safety once birds are moved into a multi-tier aviary. Not a health and safety problem from pathogen standpoint. Another experiment evaluated the impact of 25-hydroxycholecalciferol (Bio-D) on production, egg, and skeletal characteristics in early or late phase production of laying hens. Bio-D supplementation did not have an impact on egg or skeletal characteristics but resulted in 16 more eggs per hen housed when introduced at 45 wk. of age.

Marissa Erasmus - Purdue studied probiotics for laying hens and vocalizations and stress. Pine shavings and miscanthus grass for litter for turkeys, no real changes. W36 hens like plastic astroturf better than litter in the nest box. Orange vinyl curtains for nest boxes were also studied..

Paul Patterson Penn State Mike Hulet retired. Looked at environmental effects on meat bird production. Vegetative buffers and cover component for birds outside is also an interest for Penn State Researchers. Birds want cover not open pasture. Looking at Methionine alternatives due to Organic rules. Also at corn particle size. Young birds like smaller particles better than adult birds. Looking at broiler, layer, and turkey manure output. Find less output now compared to years ago. Game birds and UV exposure and changes in shell color and quality. Ensiling method to dispose of dead birds. Need to put down commercial size flock. Feeding turkeys with naturalized diets.

Break from Station Reports:

***Special Welcome and Report:***

Dr. Eileen Thacker Center Director USDA-ARS. A welcome and what is going on. In 2014 they merged the Russell Research Center and Southeast Poultry Center and other facilities to make Athens the center of much of USDA-ARS poultry research. Now there is the US National Poultry Research Center. They just received $155 mill for new facility at the Southeast Poultry Center. Then Avian Disease and Oncology (ADO) lab will come to Athens when the new facility is completed. They work with other agencies and researchers on poultry issues. They have 7 units with Egg safety, Bacterial resistance, processing group, imaging group, mycotoxin group, exotics (AI and New Castle), and endemic group. Genetics group and Marek’s group with ADO lab. (See website for more info <https://www.ars.usda.gov/southeast-area/athens-ga/us-national-poultry-research-center/adol/> ).

**Break at 9:56 to 10:15 am.**

Dr. John Glisson, Vice President of Research Programs, USPEA was introduced by Ken Anderson. John was on the faculty at UGA Vet School and retired in 2011 to work with USPEA. USPEA is located in Tucker, GA. Not a political action organization. More communication and technical and educational organization. Funds come from IPPE and US Poultry Foundation and others. Research funding is done by a 15 person advisory committee of poultry industry personnel. They determine research priorities and proposal reviews and funding.

They have 2 programs. One is a comprehensive program that started in 1962 for Marek’s and Infectious bursal disease research funding. Now there are 17 areas of potential funding. New priorities added as needed. The Board Research Initiative started 5 years ago with 25 people (CEO’s, presidents, etc). They have set up flexible proposal dates for the projects they want researched. Topics generally fall into two categories: Food Safety and Welfare, third is Environmental issues. Requests go out in September. Short one page proposal due Nov 1. In recent years SE has been a priority. Especially in ground turkey and chicken, which are high risk products. Need fast – real time analysis of SE or other pathogens to determine if they can be used for ground product. Now also focusing on Campylobacter, especially in chickens. Reducing Campy in all steps of growing and processing needs to be researched. Egg industry is good at SE control, now want to look at all Salmonella types. Welfare is another big topic. Need objective measures of welfare in cage, cage free, aviary, etc. systems. Reporters ask why birds outside are breaking wings, legs, etc and ask what can be done? Put in cages is the answer, but they don’t like cages. Can’t win. Slow growing broilers research is needed since consumers seem to want slower growers. Social enhancements and welfare for broilers and turkeys. Euthanasia is also an area to study. Mass and individual. We know what works but is there research to support that it is humane. VSD is being funded. Live-haul research is needed also. Are the trailers up-to-date? Pretty primitive. Environmental issues, such as carcass disposal from mass depopulation. Biosecure handling. Processing plant water use is also an issue. Chemicals for SE control during processing (PA) how to deal with this in wastewater. More funding will be available on water issues. Water runoff is also an issue. Seldom get more than 12 or so proposals for each topic. So pretty good chance for funding. They consider proposals from University, ARS, private companies, etc. How much funding per proposal. This year they have $1.5 million. Board projects are capped at $125K, the comprehensive program rarely goes over $100K. Nov 1 or May 1 are pre-proposal deadlines. Can be submitted by individuals, but full proposals must come through the institution. Why not electronic submissions? Soon to be that way.

Mike Darre – Uconn In an attempt to determine the effect of carvacrol on the Avian Influensa virus a study was undertaken. It was found that carvacrol at 0.2% and 0.1% significantly reduced the virus titer when compared to controls (P<0.05), suggesting potent antiviral activity of the phytochemical against AIV. Further studies to delineate the mechanism(s) behind the antiviral effect of CR are underway.

Another study was undertaken to determine the effect of probiotic treatment of hatching eggs. Eggs in the treatment group were sprayed with probiotic cultures [Probiotic cocktail- PC (Lp - Lactobacillus paracasei DUP-13076 and Lr - L. rhamnosus NRRL-B-442)] (7 log CFU/egg) while control eggs were sprayed with phosphate buffered saline (PBS) prior to incubation and hatching. Following hatch, chicks were housed in floor pens at the UConn poultry research unit for six weeks and fed with feed containing PC (7 log CFU/g of feed) or PBS. Ten eggs/birds were sampled on d18 and 21 (day of hatch), wk1, wk3 and wk6 of the study. Results of the study revealed that early probiotic supplementation significantly (P ≤ 0.05) improved embryonic growth. On d18, when compared to the control, PC treated eggs demonstrated 6.6, 5.5 and 9.2% increase in embryo weight, crown rump length and tibiotarsal length, respectively. With respect to body weight gain, an average of 5.6-8.2% increase in live weight and a concomitant improvement in FCR was observed in PC treated chicks when compared to the control.

Lighting research is continuing with LED’s in a commercial egg laying facility. Birds in the bottom row of cages with an LED lamp in each cage produced more eggs than birds lit only by the ceiling lamp between rows. Another study is underway looking at an LED lamp with a filter that eliminates the UV and blue light spectrum and its effect on ectoparasites on the bird.

Deana Jones USDA ARS She is focusing on objective 3. Working with Ken Anderson and the NCSU flock test. Currently looking at egg quality with cage free egg and Brown vs White birds. The focus is on welfare quality assessment, microbiology, etc. Not analyzing conventional cages now. They have a new egg quality assessment system for egg shape and volume that can be used for bones also. This is a 3D imaging system. People who want to train on equipment at ARS can do so. The HB LED candling light developed for the Egg Quality School is now available for general purchase. AH pharma is making them at a cost of about $280 per lamp. ARS is doing bone imaging now for anyone that needs it.

Casey Ritz – UGA A lot happening at UGA. Antimicrobials and processing. Dr. Kim Cook is studying probiotics and food grade alcohols. Also some Microbiome work and Quail work on SE and Campy. Casey is working on antibiotic impact on S. Heidelberg (Nelson Cox and Kim Cook). They are also doing some poultry litter and manure studies. Mortality composting and viral livability is another area of research. Casey has done a lot of work on the NRCS handbook on water quality, and they now want it to be an environmental quality handbook. He provided a list of current topics in the notebook. (See Objective 2 committee report above.) They are looking for reviewed technical bulletins for the handbook. Engineered bio-carbon as a feed supplement is a new area of research. It is tot approved by USDA as feed ingredient yet. Also work on litter and bedding amendments for ammonia control. They also have two position openings in the department. Harsha does processing work and microbiology on birds and cross contamination.

Jody Purswell MS USDA-ARS They are conducting nutrition research on insect meal to replace SBM in the diet. Light leaking through fans results in more feed consumption, due to more activity, etc. not the best feed conversions so looking a better light traps on inlets, fans, etc. They are also comparing the OnceTM lamp and incandescent lamp to determine if there is a Clux vs Human lux difference in performance. No real production difference. In another study they wanted to determine an optimal time to withdraw antimicrobials (antibiotics and anticoccidials) and replace them with probiotics in broiler diets without adverse effects on growth performance. In place of antimicrobials, half of the diets were supplemented with probiotics. On day 14, all the birds were challenged by oral gavage of 10 × dose of commercial coccidial vaccine including live Eimeria. The results suggest that supplementing probiotics may alleviate the adverse effects of coccidiosis on growth performance of broilers fed diets with antimicrobial taken out on day 21 or 28.

Jorge A. Vizcarra Alabama A&M He is doing work with Avian species appetite and feed intake and the relationship with ghrelin. He is also studying the effect of coccidiosis and ghrelin in gut. Ghrelin has a role in the regulation of CRH.

***End of Station Reports.***

**Other final business**

Rich Gates noted that the International Livestock Environmental Symposium (ILES) on Animal responses to environment and precision livestock farming will be held on Sept 25-27, 2018 in Omaha, NE. Abstracts may be due by October 1.

(<https://asabe.org/meetings-events/2018/09/10th-international-livestock-environment-symposium-(iles-x).aspx> )

Ken Koelkebeck reminded the objective groups to work on the re-write and come up with newly worded objectives for the re-write. We need those and drafts by the January meeting in Atlanta.

Ken would send out materials from USDA on the proposal re-write process.

Thanks to the host committee of Deanna Jones, Harshavardhan Thippareddi and their crew for arrangements for the hotel, the great classroom, meals, snacks and tours.

Thanks to Anup for chairing the meeting this year as Sr. Executive.

The group wished Dr. Mike Darre all the best in his retirement.

Ken Anderson moved to adjourn, and Tony Pescatore Seconded.

The meeting was adjourned at 12:04 pm.

Many of the group proceeded to tours of UGA farm and USDA ARS processing facilities.

Respectfully submitted by Michael J. Darre