Poultry Science Association
95th Annual Meeting
Program

July 16-19, 2006
University of Alberta
Edmonton, Canada
Poultry Science Association  
95th Annual Meeting Program

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<td>Monday, July 17</td>
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<td>Agriculture/Forestry Centre Rm. 318J</td>
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<td>8:00 AM – 12:00 PM</td>
<td>Scientific Sessions</td>
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8:00 AM – 5:00 PM
Commercial Exhibits
ETLC Solarium

8:00 AM – 5:00 PM
Poster Session
ETLC Solarium

11:30 AM – 1:00 PM
*Poultry Science Journal
Editors’ Luncheon*
Lister Hall

12:00 PM – 1:00 PM
*Student Lunch*
Faculty Club

12:00 PM – 1:00 PM
S292 Lunch*
Lister Hall

1:15 PM – 4:00 PM
Scientific Sessions
NREF 1-001
NREF 1-003
NREF 2-001
NREF 2-003
ETLC E1-013

2:00 PM – 4:00 PM
ARPAS Exam
Agriculture/Forestry
Centre Rm. 318J

4:00 PM
Ukrainian Village Tour
& BBQ*
Ukrainian Village
Bus Pick up: Lister Hall
87th Avenue & 116 Street

Tuesday, July 18
6:00 AM
Fun Run Bus Pick up:
Lister Hall 87th Avenue & 116 Street

6:30 AM
Fun Run*

7:00 AM – 8:30 AM
Michigan State
Breakfast*
Lister Hall

7:00 AM – 4:00 PM
Registration Open
ETLC Solarium

7:30 AM – 5:00 PM
Pre-load & Preview
Room
ETLC 1-008

7:30 AM – 5:00 PM
Job Resource Center
ETLC Solarium

8:00 AM – 12:00 PM
Scientific Sessions
NREF 1-001
NREF 1-003
NREF 2-001
NREF 2-003
ETLC E1-013
ETLC E1-017

8:00 AM – 5:00 PM
Cyber Café
GSB 217
You must have a
campus computer ID
provided with your
registration package.

8:00 AM – 5:00 PM
Hospitability Lounge
ETLC Solarium

8:00 AM – 5:00 PM
Commercial Exhibits
ETLC Solarium

8:00 AM – 5:00 PM
Poster Session
ETLC Solarium

10:00 AM
Devonian Gardens Tour*
Buses leave from Lister
Hall 87th Avenue and 116
Street

11:30 AM – 1:00 PM
*JAPR Editors’ Luncheon*
Lister Hall
11:30 AM – 1:00 PM  
ARS Scientist’s Lunch*  
Lister Hall

12:00 PM – 1:00 PM  
WPSA-USA Branch Lunch*  
Lister Hall

12:00 PM – 1:00 PM  
APHS Lunch*  
Lister Hall

1:00 PM – 2:00 PM  
WPSA Lecture  
ETLC E1-001

2:00 PM – 4:00 PM  
PSA Business Meeting  
ETLC E1-001

Wednesday, July 19

7:00 AM – 12:00 PM  
Registration Open  
ETLC Solarium

7:30 AM – 5:00 PM  
Pre-load & Preview Room  
ETLC 1-008

7:30 AM – 5:00 PM  
Job Resource Center  
ETLC Solarium

8:00 AM – 5:00 PM  
Cyber Café  
GSB 217  
You must have a campus computer ID provided with your registration package.

8:00 AM – 12:00 PM  
Scientific Sessions  
NREF 1-001  
NREF 1-003  
ETLC E1-001  
ETLC E1-013  
ETLC E1-017

8:00 AM – 5:00 PM  
Poster Session  
ETLC Solarium

12:00 PM – 1:00 PM  
WPSA – Canada Branch Lunch*  
Lister Hall

12:00 PM – 1:00 PM  
National Poultry Waste Mgmt Lunch*  
Lister Hall

12:00 PM  
Golf Scramble/Lunch*  
East Ground Exit of ETLC

1:30 PM – 5:00 PM  
Poultry Welfare Symposium  
ETLC E1-001

1:30 PM – 5:00 PM  
Metabolic Disease Symposium  
ETLC E1-013

1:30 PM – 5:00 PM  
Embryo Symposium  
ETLC E1-017

6:00 PM – 10:00 PM  
PSA Awards Banquet*  
Fantasyland Hotel  
Beverly Hills Ballroom

Please refer to the scientific program portion of this book for detailed information on oral and poster presentations. Please note that all rooms and times are subject to change. Always be sure to check room signs and the daily newsletter for any last minute room changes or cancellations.

Any event noted with an asterisk (*) will require a ticket for entrance.
On behalf of the PSA Board of Directors, I want to welcome all of you to the 95th annual meeting of our Association. The PSA annual meeting represents a unique venue each year for our members for professional development, as well as fellowship. This gathering allows us to share our professional, as well as personal experiences with colleagues from many parts of the world. More importantly, the annual meeting provides an opportunity for all of us to reflect on the passing of another year, visit with old friends and make new ones.

John Blake and chair-elect Murray Bakst chair the Scientific Program Committee. Section chairs are Michael Darre, Rich Reynnells, James Petitte, Mark Cook, Curtis Novak, Joseph Moritz, Rob Porter, Jeff Buhr, Bruce Rathgeber, James Hermes, Joseph Hess and Kevin Downs. They worked very hard to put together another stimulating scientific program in Edmonton, Canada.

It all begins on Sunday with the Ancillary Scientist Symposium, the National Extension Workshop, and the Informal Nutrition Conference. Beginning with this year, all the PSA Symposia, including the Ancillary Scientist Symposium, will be accessible by all registered participants. As usual, Monday through Wednesday is heavily scheduled with oral and poster presentations. We will have the WPSA Lectureship and the PSA Business Meeting on Tuesday afternoon. On Wednesday afternoon there are three Symposia scheduled:
Realistic Views Concerning Poultry Welfare; Metabolic and Cardiovascular Diseases in Poultry: Nutritional and Physiological Aspects; and Managing the Embryo for Performance.

Of course, we have some leisure activities planned for you as well. Sunday night we will welcome you with our Opening Session and the traditional Ice Cream Social and treat you to a BBQ at the Ukrainian Cultural Heritage Village on Monday night. The PSA Awards Banquet is scheduled for Wednesday evening, when we proudly recognize the accomplishments of our members and industry leaders. This year’s PSA Honorary Members Mr. Don Tyson and Mr. Bo Pilgrim have both agreed to honor us with their presence.

I would like to take this opportunity to express our sincere appreciation to Frank Robinson and Valerie Carney on behalf of our Host Committee at The University of Alberta, to John Blake on behalf of the Scientific Program Committee, to our sponsors, to FASS staff Mary Swenson, Susan Pollock, Debra Seymour, Derek Wade, Lisa Hamilton and Keely Roy, and to our Executive Director Jim Kessler for their tireless efforts to make this a successful and memorable meeting.

S. F. “Sarge” Bilgili, President
2006 PSA Annual Meeting
Important Contact Information

Ambulance, Fire, Police
Call Campus Security............................... 780-492-5050
University of Alberta Hospital................... 780-407-8822
PSA Business Office................................... 217-356-5285
Lister Centre (Lister Hall & Schaffer)
Guest Services........................................... 780-492-6057
Campus Tower Signature Suites ............. 780-439-6060
Edmonton House Signature Suites............. 780-420-4000

Membership

Membership in PSA is not required to attend this meeting. All that is needed is an interest in the field of poultry science; however, the difference between the member and nonmember registration fee makes it very attractive to join PSA. Members also receive other discounts throughout the year, making PSA membership both cost effective and beneficial. A PSA membership application is included in this booklet.

Abstract Book

Abstract books will not be mailed prior to the meeting. Participants will be able to pickup their abstract book/CD in the registration area, which will be in the ETLC Solarium.

Continuing Education

This meeting is worth up to 20 ARPAS Continuing Education Units.

On-Site Registration

Registration will be located in the ETLC Solarium. Registration hours for the 2006 PSA Annual Meeting, including special symposia and other events will be as follows:

Saturday, July 15............................... 3:00 PM – 7:00 PM
Sunday, July 16............................... 7:00 AM – 8:00 PM
Monday, July 17............................... 7:00 AM – 5:00 PM
Tuesday, July 18............................... 7:00 AM – 4:00 PM
Wednesday, July.............................. 7:00 AM – 12:00 PM
Awards Banquet Tickets

Tickets for the Awards Banquet on Wednesday, July 19 will be available on-site as space allows, so get them early! You may purchase tickets in the registration area.

Important Reminder!

Wear your meeting badge! It is your admission to all special events and meal functions. Tickets for special events will be collected at the door or table for the appropriate event. Event name, location and date will appear on the ticket – please be sure to give the ticket-taker the appropriate ticket.

Pre-loading Room

Room ETLC 1-008

For PowerPoint Presentations

All PowerPoint presentations will be loaded in advance of each session. No presentations will be loaded while the session is in progress or between presentations. If you cannot follow these guidelines you should plan to present without visual tools. Each session room will be equipped with a laptop computer configured with PowerPoint 2003, a software DVD player, and the latest versions of Acrobat Reader, Windows Media Player, and QuickTime Player. The room will also have standard audio equipment. The use of personal computers for presentations in the session rooms will not be permitted.

Presenters must deliver their presentations on CD-ROM, data stick, 3.5” diskette, or zip disk (100 or 250 meg) to the AV Technician in the Pre-Load Room located in Room ETLC 1-008. Please do not deliver your presentation to the session room! All media must be labeled with the following information:

- Presenting author’s name
- Date of presentation
- Session name
- Session room
- Time of presentation and presentation number (found in program)
Properly labeled media must be delivered to the Pre-load room according to the following schedule:

**Sunday Symposia** – media must be delivered by 4:00 PM on Saturday

**Monday through Wednesday AM presentations**
(scheduled prior to noon) – media must be delivered by 4:00 PM the day prior to the presentation

**Monday through Wednesday PM presentations**
(scheduled after noon) – media must be delivered by 10:00 AM on the day of the presentation

**Preview Room**

Meeting room ETLC 1-008 will be available for presenters to plug in their personal laptop computers and preview their presentations. Please remember that the use of personal computers will only be allowed in the preview room. Personal computers in session rooms will not be permitted.

**PSA Job Resource Center**

**ETLC Solarium**

**Let PSA Launch Your Career!**

The PSA Careers Committee has organized the Annual Job Resource Center at the PSA Annual Meeting. Graduates, undergraduates, and professionals looking for a job are encouraged to participate. There will be opportunities for formal interviews at the meeting. There is no charge for service.

**Post Your Job Opening With PSA**

The PSA Careers Committee would like PSA members affiliated with companies, universities or governmental agencies to participate in the 2006 Job Placement Center. If you know of a job opening the Careers Committee will make sure that you receive the resumes of people participating in the Job Placement Center before the meeting.

**Job Resource Center Hours:**

Monday & Tuesday ......................... 7:30 AM – 4:00 PM
Wednesday ..................................... 7:30 AM – 12:00 PM
PSA 2006
Special Events

Fun Run

The 2006 PSA Fun Run will be Tuesday morning at 6:30 AM. Registered participants will pickup their t-shirt when they register for the meeting. Please meet at Lister Hall (87th Ave. and 116 St) where transportation will be provided to Hawrelak Park where the Fun Run will take place.

PSA BBQ

The 2006 PSA BBQ will be held on Monday, July 17 at the Ukrainian Cultural Heritage Village. This will be a very special event where you will not only be able to socialize with other PSA members, but also tour this incredible village. The Ukrainian Cultural Heritage Village is an open-air museum that was built to resemble pioneer settlements in east central Alberta. Buildings from the surrounding communities have been moved to the Village and restored to various years within the first part of the twentieth century.

Entrance into the park will be restricted to the shuttle service provided for this event. There are buses leaving from Lister Hall in shifts to give everyone plenty of time to eat dinner and tour the village.

Devonian Botanic Gardens

A tour of the Devonian Botanic Gardens will be offered on Tuesday, July 18 at 10:30 am. This picturesque attraction features over 10,000 species of plants showcased over 80 acres. An authentic Japanese garden, herb garden, large collection of peony, iris and lily; and 110 acres of nature trails and ecological and wetland reserves.

Transportation and lunch will be provided. Please meet at Lister Hall (87 Ave. and 116 St). Advance purchase of tickets is necessary for this tour.
Golf Scramble

The 2006 Golf Scramble will take place on Wednesday, July 19 at Victoria Golf Course, with a tee time of 12:30 PM. Your $50 entry fee includes lunch and all course fees.

PSA Awards Banquet

Please join us for a celebratory evening honoring the 2006 award winners. All meeting participants, spouses and friends are welcome at this event. The banquet will be held on Wednesday, July 19 at the Fantasyland Hotel which is located in the world famous West Edmonton Mall. The evening is sure to be a good time for all. Please make sure to purchase your ticket in advance. A limited number of tickets will be available for purchase at the registration desk in the ETLC Solarium. Transportation will be provided with buses leaving from Lister Hall starting at 4:00 p.m. and Edmonton House at 4:30 p.m. and returning at 30 minute intervals from 9:00 p.m. to 11:30 p.m.
PSA 95th Annual Meeting
Sponsors

GOLD LEVEL
$5,000 - $15,000

DSM Nutritional Products, Inc.
  Jones-Hamilton Co.
  Novus International, Inc.

SILVER LEVEL
$1,500 - $4,999

Alberta Agriculture, Food and Rural Development
Alberta Chicken Producers
Archer Daniels Midland Co.
Ajinomoto Heartland LLC
Alpharma Animal Health
BASF Plant Science/ExSeed Genetics
Canadian Bio-Systems, Inc.
Cargill Animal Nutrition
  Chick Master
  Cobb-Vantress, Inc.
Danisco Animal Nutrition
Elanco Animal Health
Hatch Tech Incubation Technology
  Hy-Line International
  Jamesway Incubator
  Kemin Americas Inc.
  Monsanto Company
Poultry Research Center
Southern Poultry Science Society
  Tyson Foods, Inc.
Syngenta Animal Nutrition
University of Alberta, Faculty of Agriculture, Food and Home Economics
USDA/CSREES Plant and Animal Systems
USDA/CSREES Animal Genetics
Zinpro Corporation
PSA 95th Annual Meeting
Exhibitors

Alternative Design
Biomin USA Inc.
Canadian Bio-Systems Inc.
PetAg
Poultry Science Association
Probiotech International, Inc.
Quality Technology International, Inc.
Sunday, July 16

SYMPOSIA AND ORAL SESSIONS

Ancillary Scientists Symposium
Functional Genomics: Building the Bridge Between the Genome and Phenome
Chair: Craig N. Coon, University of Arkansas
ETLC 1-003

8:00 AM
Introduction and opening remarks.
C. N. Coon, University of Arkansas.

Session I: The chicken as a model organism.

8:05 AM
Emergence of the chicken as a model organism: Implications for agriculture and biology.
D. Burt, Roslin Institute, Edinburgh, Scotland.

Session II: Global gene expression profiling of avian systems (Gene expression - Functional genomics).
Moderator: K. C. Klasing, University of California, Davis.

9:00 AM
Global gene expression in embryonic development.
P. Antin, University of Arizona, Tucson.

9:25 AM  1
Analysis of global gene expression in the avian neuroendocrine system.
T. E. Porter*, L. E. Ellestad, M. Muchow, S. A. Jenkins, and M. S. Byerly, University of Maryland, College Park.

9:55 AM
Break.

10:10 AM  2
Functional mapping of gene networks controlling growth and metabolism.
L. A. Cogburn*, University of Delaware, Newark.
Genetic mechanisms regulating feed intake, energy balance and body weight in poultry.
M. P. Richards*, USDA, ARS, ANRI, Growth Biology Laboratory, Beltsville, Maryland.

Application of macrophage and intestinal cDNA microarrays to study innate mucosal immunity in avian coccidiosis.
H. Lillehoj*, United States Department of Agriculture, Animal and Parasitic Diseases Laboratory, Beltsville, Maryland.

Session III: Merging QTL scans with gene expression scans (Genome and QLT analysis).
Moderator: K. C. Klasing, University of California, Davis.

Analysis of quantitative disease-resistance traits.
S. J. Lamont*, Iowa State University, Ames.

Genomics meets ethology.
L. Anderson, Swedish University of Agricultural Sciences, Uppsala, Sweden.

Genetical genomics: Combining gene expression with marker genotypes.
D. De Koning*, C. Cabrera, and C. Haley, The Roslin Institute, Roslin, United Kingdom.

Session IV: Emerging technologies in the post-genomic era.

Functional annotation of genomic data with metabolic inference.
R. L. Walzem*, Texas A & M University, College Station.

Using proteomics to understand avian systems biology and infectious disease.
H. Liu*, North Carolina State University, Raleigh.
3:40 PM
Industry perspective.
D. Harry, Genetic Foundations, Philomath, Oregon.

4:10 PM
Concluding remarks.
J. Hodgson, Michigan State University.

National Extension Workshop
National Poultry Extension Workshop
Chair: Michael Davis, Texas A&M University
ETLC 1-007

8:00 AM 9
Washington update.
R. D. Reynnells*, USDA, Washington, DC.

8:20 AM
Avian Influenza: Pandemic Potential.
Carol Cardona, University of California, Davis.

8:50 AM
Biosecurity: Educational Programs.
Francine Bradley, University of California, Davis.

9:10 AM
Bioterrorism, Ecoterrorism, and Animal Rights.
Larry Katz, Rutgers, New Brunswick, New Jersey.

9:40 AM
Break.

9:55 AM
Animal ID Programs: Industry Perspective.
Bill Mattos, California Poultry Federation, Modesto, California.

10:15 AM
Animal ID Programs: Fancier Perspective.
Pat Malone, Arlington, Texas.

10:35 AM
OIE Guidelines.
Mary Madell, USDA/APHIS, Washington, D.C.
Informal Nutrition Symposium

Understanding and Combating Metabolic Challenges, “In Honor of our Great Academic Advisors and Life Mentors”, Recognitions and Award Presentations
Chair: Mamduh Sifri, Archer Daniels Midland
ETLC 1-001

1:00 PM Understanding and Combating Metabolic Challenges - Introduction.
“In Honor of our Great Academic Advisors and Life Mentors” - Team Members: Roselina C. Angel, University of Maryland, Julia Dibner, Novus International, Wilhelm Guenter, University of Manitoba, Elizabeth Koutsos, California Polytechnic State University, William W. Saylor, University of Delaware, Newark.

1:05 PM Symbolism for the Advisor and the Mentor.

1:10 PM Metabolic Challenges; Past, Present and Future.
Steven Leeson, University of Guelph, Guelph, ON, Canada.

1:45 PM Metabolic Challenges and Early Bone Development.
Julia Dibner, Novus International, St. Louis, Missouri.
2:15 PM
The Economics of Combating Metabolic Challenges in Poultry.
Roselina C. Angel, University of Maryland, College Park.

2:45 PM
Metabolic Challenges Caused by Mycotoxins and Potential Solutions.
Johann Bauer, Technische Universitat, Munchen, Germany.

3:15 PM
Break.

3:30 PM
The Impact of Genetic Variation in the Immune System on Production - Traits and Metabolic Challenges in Poultry.
Susan Lamont, Iowa State University, Ames.

4:00 PM
The Role of Vitamins and Feed Enzymes in Combating Metabolic.
Jiri Broz, DSM, Kaiseraugst, Switzerland.

4:30 PM
Discussions, Conclusions, Messages and Recommendations.
Wilhelm Guenter, University of Manitoba, Winnipeg, MB, Canada and Elizabeth Koutsos, California Polytechnic State University, San Luis Obispo.

5:00 PM
Adjourn with a Meaningful Message.
Monday, July 17
Environment and Management

Broilers and Turkeys
Chair: Danilo Franco, University of Alberta
ETLC 1-013

8:00 AM 11
Effect of egg position and turning frequency during storage and incubation on hatchability of broiler hatching eggs.
J. T. Brake*, O. Elibol†, and K. U. Sariyuz‡, †North Carolina State University, Raleigh, ‡University of Ankara, Ankara, Turkey.

8:15 AM 12
Effect of restricted and normal ventilation on broiler hatching egg temperature and embryonic development.

8:30 AM 13
Genetic strain, egg size, and flock age influences hatchability and broiler performance.

8:45 AM 14
Influence of egg weight on the uptake of residual yolk in Ross 708 broilers.
R. A. Renema*, N. J. Wolanski, and F. E. Robinson, University of Alberta, Edmonton, AB, Canada.

9:00 AM 15
Foot pad lesions, pasture condition, and bacterial pathogens in free range heritage vs. commercial turkey varieties.
B. McCrea*, M. Leslie‡, L. Stevenson‡, K. Macklin‡, L. Bauermeister‡, and J. Hess‡, †University of California, Davis, ‡Auburn University, Auburn, Alabama.

9:15 AM 16
Feed conversion, growth rate, and carcass yield in free range heritage vs. commercial turkey varieties.
L. M. Stevenson*‡, M. A. Leslie¹, B. A. McCrea², K. S. Macklin¹, L. J. Bauermeister¹, and J. B. Hess¹, †Auburn University, Auburn, Alabama, ‡University of California, Davis.
Use of a feed-grade enzyme in broiler diets to reduce paw burns.
M Nagaraj*, J. B Hess, and S. F Bilgili, Auburn University, Auburn, Alabama.

Dietary modifications to reduce nitrogen consumption and excretion in broilers.
R. Angel*, W. Powers, S. Zamzow, and T. Applegate, University of Maryland, College Park, Iowa State University, Ames, Purdue University, West Lafayette, Indiana.

Comparison of methods for weighing broilers – manual vs. computerized scales.
K. Budgell*, J. MacIsaac, and B. Rathgeber, Nova Scotia Agricultural College, Truro, NS, Canada, Atlantic Poultry Research Institute, Truro, NS, Canada, Agriculture & Agri-Food Canada, Truro, NS, Canada.

Varying dietary protein level during rearing affects carcass and reproductive traits of broiler breeder hens at sexual maturity.

Factors affecting egg properties of broiler breeder hens: Egg colour, egg quality, egg shape.

Characterization of relationships among broiler breeder male growth, variability, and mortality.
N. Wolanski*, F. Robinson, R. Renema, and T. Inglis, University of Alberta, Edmonton, AB, Canada, Poultry Health Services Ltd., Airdrie, AB, Canada.
Growth characteristics as a predictor of male quality in broiler breeders.
A. Herron*, R. A. Renema¹, F. E. Robinson¹, and J. L. Wilson²,
¹University of Alberta, Edmonton, AB, Canada, ²University of Georgia, Athens.

Comparing the economics of protein and energy levels in full fed molting procedures.
P. L. Ruszler* and C. L. Novak, Virginia Polytechnic Institute and State University, Blacksburg.

Metabolism and Nutrition

Nutrition A - Minerals and Vitamins
Chair: Todd J. Applegate, Purdue University
ETLC 1-001

Does vitamin U have potential to improve feed efficiency or strengthen the intestinal tract of broilers?
A. L. Shaw*, K. S. Macklin¹, J. P. Blake¹, W. V. Narvaez-Solarte², and P. K. Gunawardana¹, ¹Auburn University, Auburn, Alabama, ²Universidad de Caldas, Caldas, Columbia.

Maternal dietary 25-OH vitamin D₃ improves chick early innate immunity.
J. L. Saunders-Blades* and D. R. Korver, University of Alberta, Edmonton, Canada.

The vitamin A requirement for optimum growth, egg production, and hatchability in Japanese Quail.
K. A. Livingston* and K. C. Klasing, University of California, Davis.

Effect of dietary folic acid supplementation on egg folate content throughout the production cycle of laying hens.
T. M. Dickson*, W. Guenter, and J. D. House, University of Manitoba, Winnipeg, MB, Canada.
9:00 AM  30
Effect of vitamin E and fat sources on intestinal calcium uptake and production parameters of laying hens.
D. Franco-Jimenez*1, R. Renema1, M. Zuidhof2, and F. Robinson1, 1University of Alberta, Edmonton, AB, Canada, 2Alberta Agriculture, Food and Rural Development, Edmonton, AB, Canada.

9:15 AM  31
Phase-feeding during the grower and finisher periods: impact of calcium and phosphorus.
V. Brewer*, T. O’Connor-Dennie, and J. Emmert, University of Arkansas, Fayetteville.

9:30 AM  32
Egg storage time before incubation and hen’s age affect the incidence of Phosphorus rickets in broiler chicks.
M. Y. Shim*, G. M. Pesti, R. I. Bakalli, and H. M. Edwards, Jr., University of Georgia, Athens.

9:45 AM  33
Calcium particle size effects on excreta, and urinary Ca and P changes in broiler breeder hens.
M. K. Manangi* and C. N. Coon, University of Arkansas, Fayetteville.

10:00 AM
Break.

10:15 AM  34
Performance and egg quality of laying hens fed Egg Shell 49 or Replamin.
M. T. Farran*, A. N. Kadi1, and G. W. Barbour2, 1American University of Beirut, Beirut, Lebanon, 2Lebanese Agricultural Research Institute, Beqa’a, Lebanon.

10:30 AM  35
Benefit of MINTREX® P blend of organic trace minerals on breaking strength, ash content, tibial dyschondroplasia, synovitis and pododermatitis in heavy weight tom turkeys.
J. Richards*, M. Quiroz1, W. Williams2, and J. Dibner1, 1Novus International, Inc., St. Louis, Missouri, 2Akey, Lewisburg, Ohio.

10:45 AM  36
Growth and mineralization of the femur of the male turkey.
The relationship between growth of commercial toms and linear skeletal development.
M. S. Lilburn*1, A. Mitchell2, and J. Anderson1, 1The Ohio State University, Wooster, 2USDA, Beltsville, Maryland.

Supplementation with MINTREX® organic trace minerals improves growth performance and leg abnormalities in turkeys.
P. R. Ferket*1, E. O. Oviedo1, J. L. Grimes1, D. V. Bohorquez1, A. A. Santos1, J. D. Richards2, and V. Felts3, 1North Carolina State University, Raleigh, 2Novus International, Inc., St. Charles, Missouri, 3Goldsboro Milling Co., Goldsboro, North Carolina.

Comparison of inorganic and organic selenium sources on egg quality, performance and reproductive parameters laying hens.
J. Purreza* and A. Pishnamazi, Isfahan University of Technology, Isfahan, Isfahan, Iran.

Metabolism and Nutrition

Nutrition B - Gut Health and Early Nutrition
Chair: Paul H. Patterson, The Pennsylvania State University
ETLC 1-017

Growth performance, gut health, and feed passage of Salmonella-challenged chickens reared on litter floors or in cages.

Immune, growth and carcass responses to dietary threonine of broilers raised in different litter conditions.
A. Corzo*, M. T. Kidd1, G. T. Pharr1, W. A. Dozier III2, and E. A. Koutsos3, 1Mississippi State University, Mississippi State, 2USDA-ARS Poultry Research Unit, Mississippi State, Mississippi, 3California Polytechnic State University, San Luis Obispo.
Denaturing gradient gel electrophoresis analysis of 16S ribosomal DNA amplicons to analyze changes in ileum bacterial population of turkeys fed different diets and after infection with *Salmonella* spp.

A. A. Santos Jr.*1, P. R. Ferket1, F. B. O. Santos1, N. Nakamura2, C. Collier2, and H. R. Gaskins2, 1North Carolina State University, Raleigh, 2University of Illinois, Urbana.

Modern broilers have a reduced innate immune response compared to random-bred strains when challenged *In Vitro* with *E. coli*.


Effect of PrimaLae®, direct fed microbial, on ileal absorption, energy expenditure and intestinal microbial fermentation.

M. Chichlowski*1, W. J. Croom1, M. A. Froetschel2, M. D. Koci1, B. M. McBride1, R. Qiu1, and L. R. Daniel1, 1North Carolina State University, Raleigh, 2University of Georgia, Athens, 3University of Guelph, Guelph, ON, Canada.

Beneficial effects of dietary Bacillus subtilis C-3102 spores (CALSPORIN®) on broiler breeder egg production and hatchability in Brazilian trials.


Effect of Bio-Mos in replacement pullets and layers.

R. J. Balander*, Michigan State University, East Lansing.

Effects of MOS and avilamycin on broiler performances and carcass yield.

M. Haj Ayed1, A. Bessadok*, and M. A. Jarraya1, 1Ecole Supérieure d’Horticulture et de l’évage, Chott Mariem, Sousse, Tunisia, 2Société Tunisiene d’Aviculture, Borj Cédria, Rades, Tunisia.
Responses to lysine levels in broiler chickens fed mannan oligosaccharide and yeast as an alternative to antibiotic growth promoters.
S. Gomez* and M. L. Angeles, National Center for Research in Animal Physiology - INIFAP, Ajuchitlan, Queretaro, Mexico.

Assessing liver energy metabolism of late term turkey embryos using microarrays.
J. de Oliveira*1, P. Ferket1, C. Ashwell1, and Z. Uni2, 1North Carolina State University, Raleigh, 2Hebrew University of Jerusalem, Israel.

Lipid yolk utilization of late term broiler embryos.
Z. Uni* and N. Argov, Faculty of Agriculture Hebrew University, Rehovot, Israel.

Hatchery feeding of starter diets to broiler chicks.
M. T. Kidd*1, J. W. Taylor2, C. M. Page1, B. D. Lott1, and T. N. Chamblee1, 1Mississippi State University, Mississippi State, 2Tyson Foods, Incorporated, Forest, Mississippi.

Effect of dietary gelatin supplementation on early intestinal development and performance of broiler chicks.
Y. O. Fasina*1, E. T. Moran1, C. M. Ashwell2, D. E. Conner3, and S. R. Mckee1, 1Auburn University, Auburn, Alabama, 2North Carolina State University, Raleigh.

The effect of varying period and severity of early food restriction on performance and carcass quality of two broiler strains.
M. R. Bakhtiari, K. Nazer Adl, and H. Janmohammadi*, University of Tabriz, Tabriz, East Azarnijan, Iran.

A new natural feed additive for broiler chickens.
F. Saleh*1, M. Yamamoto1, M. Tahir2, A. Ohtsuka2, and K. Hayashi2, 1Biogenkoji Research Institute, Kirishima city, Mizobe, Japan, 2Kagoshima University, Biochemical Science and Technology, Kagoshima city, Korimoto, Japan.
Pathology

Genetics/Pathology
Chair: Robert E. Porter, University of Wisconsin
NREF 1-001

8:00 AM  55  
Joint analysis of health and production traits.  
R. L. Sapp*1, R. Rekaya2, and T. Wing3, 1USDA-ARS, Miles City, Montana, 2The University of Georgia, Athens, 3Cobb-Vantress, Inc., Siloam Springs, Arkansas.

8:15 AM  56  
Effects of the Rfp-Y gene complex on the development of rous sarcoma tumors in the arkansas progressor and regressor chicken lines.  
M. V. Spanakos*1, H. O. Pavlidis1, S. M. Sullivan1, L. K. Stamps1, R. Kopulos2, G. F. Erf1, and N. B. Anthony1, 1University of Arkansas, Fayetteville, 2Northern Illinois University, Dekalb.

8:30 AM  57  
Growth performance and immune response of naked neck and normally feathered genotypes of chicken.  
M. M. Fathi*, A. H. El-Attar, and A. Nazmi, Ain Sham University, Cairo, Egypt.

8:45 AM  58  
Use of real-time reverse transcriptase polymerase chain reaction assay for surveillance of influenza viruses in wild waterfowl populations.  
T. Dormitorio*, J. Giambrone, and K. Guo, Auburn University, Auburn, Alabama.

9:00 AM  59  
Over-supplementation of vitamin D and the risk of sudden death syndrome in fast growing commercial broilers.  
S. Nain*, B. Larveld, and A. A. Olkowski, University of Saskatchewan, Saskatoon, SK, Canada.

9:15 AM  60  
Effects of egg antibody to phospholipase A_{2} (aPLA_{2}) on preventing coccidia induced growth depression.  
M. Schwartz*, M. Yang, and M. Cook, University of Wisconsin, Madison.
Use of a lactobacillus-based probiotic culture to reduce *Salmonella* in day of hatch broilers.

J. P. Higgins*1, S. E. Higgins1, A. Torres-Rodriguez1, V. Salvador1, S. N. Henderson1, A. D. Wolfenden1, C. M. Pixley1, A. M. Donoghue1, G. Tellez1, W. G. Bottje1, and B. M. Hargis1,

1University of Arkansas, Fayetteville, 2PP&PSRU, ARS, USDA, Fayetteville, Arkansas.

Characterization of avian pathogenic *E. coli* in a layer production facility.

T. Baltzley* and T. Rehberger, Agtech Products, Inc.

Additional studies on idiopathic hepatic and splenic necrosis associated with vaccine administration in White Leghorn pullets.

R. Porter*1,3, E. Gingerich2, K. Toohey-Kurth1,3, C. Radi1, and D. Zoromski1, 1Wisconsin Veterinary Diagnostic Laboratory, Madison, Wisconsin, 2University of Pennsylvania School of Veterinary Medicine, Kennett Square, Pennsylvania, 3University of Wisconsin School of Veterinary Medicine, Madison.

Comparison of *S. enterica* serovar Enteritidis levels in crops of fed or fasted infected hens.


Effects of F-strain *Mycoplasma gallisepticum* inoculation at twelve or twenty two weeks of age and diet supplementation on the digestive and reproductive organ characteristics of commercial egg laying hens housed in a caged layer facility.

S. W. Park1, E. D. Peebles*1, S. L. Branton2, M. T. Kidd1, S. K. Whitmarsh1, and P. D. Gerard1, 1Mississippi State University, Mississippi State, 2USDA, ARS, Poultry Research Unit, Mississippi State, Mississippi.
Effects of pre-lay 6/85 strain *Mycoplasma gallisepticum* inoculation on the digestive and reproductive organ characteristics of commercial laying hens when given alone or in conjunction with F-strain *Mycoplasma gal-

*K. A. Viscione* 1, E. D. Peebles 1, S. L. Branton 2, A. M. Vance 1, S. K. Whitmarsh 1, R. W. Keirs 1, and P. D. Gerard 1, 1*Mississippi State University, Mississippi State, 2USDA, ARS, Poultry Research Unit, Mississippi State, Mississippi.

Natural history of lesions development in chickens succumbing to necrotic enteritis.

*A. Olkowski* 1, C. Wojnarowicz, C. Chirino-Trejo, and B. Laarveld, *University of Saskatchewan, Saskatoon, SK, Canada.*

Automatic counting with differential and selective media.

*Z. Williams and Y. Vizzier-Thaxton* 1, *Mississippi State University, Mississippi State.*

**Physiology, Endocrinology, and Reproduction**

**Endocrinology**

Chair: *James R. Millam, University of California*

NREF 2-003

Evaluation of the serotonin receptor blockers ketanserin and methiothepin on the pulmonary hypertensive responses of broilers to intravenously infused serotonin.


Evaluation of the serotonin receptor blocker methiothepin in broilers injected intravenously lipopolysaccharide and microparticles.

Expression of gonadotropin inhibitory hormone receptor (GnIHR) in the chicken: Regulation by ovarian steroids.

Pituitary procalcitonin gene expression is influenced by sexual maturation and ovarian steroids in the chicken.

Expression of 5-HT1A and 5-HT2C receptors in the hypothalamus during the turkey reproductive cycle: Colocalization with tyrosine hydroxylase.
T. Bakken*, S. W. Kang1, A. Thayananuphat1, J. A. Proudman2, and M. E. El Halawani1, 1University of Minnesota, St. Paul, 2USDA, Beltsville, Maryland.

Characterization of the serotonergic system in the brainstem during the turkey reproductive cycle.
S. W. Kang*, T Bakken, and M. E. El Halawani, University of Minnesota, St. Paul.

Dopamine and gonadotrophin releasing hormone-I neuronal activation following photostimulation in the turkey.
A. Thayananuphat*, S. W. Kang1, T. Bakken1, J. R. Millam2, and M. E. El Halawani1, 1University of Minnesota, St Paul, 2University of California, Davis.

Deiodinase II and the immediate early gene product c-fos in the hypothalamus of photostimulated turkey hens.
J. R. Millam*, E. K. Hoye1, and T. D. Siopes2, 1University of California, Davis, 2North Carolina State University, Raleigh.

The efficacy of intracerebroventricular injections of arginine vasotocin (AVT) and corticotropin releasing hormone (CRH) on plasma corticosterone levels in male and female broilers (Gallus gallus) and their respective distribution of AVT and CRH neurons.
F. N. Madison*, A. Jurkevich, and W. J. Kuenzel, University of Arkansas, Fayetteville.
Soy phytoestrogen effects on progesterone receptor, ovalbumin synthesis, and vitellogenin production in female broiler chicks.

Effect of sulfamethazine and photostimulation on gene expression of vasoactive intestinal polypeptide (VIP) and phosphodiesterase in the lateral septal organ (LSO) and pituitary gonadotropin content in the chick.
H. Li*1, J. A. Proudman2, and W. J. Kuenzel1, 1University of Arkansas, Fayetteville, 2USDA/ARS/BGPL, Beltsville, Maryland.

Immunohistochemical localization of dopamine neurons in the brain of the native Thai chicken (Gallus domesticus).
N. Sartsoongnoen*1, S. Kosonsiriluk1, N. Prakobsaeng1, A. Thayananuphat2, T. Songserm3, M. E. El Halawani2, and Y. Chaiseha1, 1Suranaree University of Technology, Thailand, 2University of Minnesota, St. Paul, 3Kasetsart University, Thailand.

Distribution of cGnRH-I immunoreactive neurons and fibers in the brain of native Thai chicken (Gallus domesticus).
N. Sartsoongnoen1, S. Kosonsiriluk1, S. W. Kang2, J. R. Millam3, M. E. El Halawani2, and Y. Chaiseha2, 1Suranaree University of Technology, Thailand, 2University of Minnesota, St. Paul, 3University of California, Davis.

Distribution of vasoactive intestinal peptide-expressing neurons in the brain of the native Thai chicken (Gallus domesticus).
S. Kosonsiriluk*1, N. Sartsoongnoen1, N. Prakobsaeng1, T. Bakken2, T. Songserm3, M. E. El Halawani2, and Y. Chaiseha1, 1Suranaree University of Technology, Thailand, 2University of Minnesota, St. Paul, 3Kasetsart University, Thailand.
Holistic vs. traditional teaching of complex aspects of avian physiology in a laboratory setting.
S. Burgos*, North Carolina State University, Raleigh.

Monitoring the health status of California game fowl flocks.
B. A. McCrea* and F. A. Bradley, University of California, Davis.

Mississippi poultry nutrient management educational programming.
J. Oldham and T. Chamblee*, Mississippi State University, Mississippi State.

Poultry grower education program on current and future issues effecting the poultry industry.
A. J. Pescatore*1, M. G. Miller2, K. D. Casey3, R. S. Gates4, and D. G. Overhults4, 1University of Kentucky, Lexington, 2Kentucky Poultry Federation/ Kentucky Egg Council, Lexington, Kentucky, 3Texas Agricultural Experiment Station, Texas A&M University, Amarillo, 4Department of Biosystems and Agricultural Engineering, Lexington, Kentucky.

The Egg and I: A training program and resource book for teachers and agents.
A. J. Pescatore*1 and M. G. Miller2, 1University of Kentucky, Lexington, 2Kentucky Poultry Federation/ Kentucky Egg Council, Lexington, Kentucky.
Major histocompatibility complex recombinant R13 antibody response against bovine red blood cells.
N. G. Wilkinson¹, W. E. Briles², R. T. Kopulos², L. M. Yates², and R. L. Taylor, Jr.*¹, ¹University of New Hampshire, Durham, ²Northern Illinois University, DeKalb.

Identification and characterization of thymosin β4 in chicken macrophages.
L. Kannan*¹,², R. Liyanage¹, J. Lay¹, and N. Rath², ¹University of Arkansas, Fayetteville, ²USDA-ARS, Poultry Production and Product Safety Research Unit, Fayetteville, Arkansas.

Plasma nitric oxide concentrations in broilers after i.v. injections of lipopolysaccharide or microparticles.

Time-course of expression of inducible nitric oxide synthase in lungs following intravenous cellulose microparticle injection in three broilers lines.

Enumeration of macrophages in the cecae following challenge with Salmonella enteritidis and treatment with a probiotic culture.

Lycopene and α-tocopherol incorporation into egg yolks and their effects on laying hen immune function.
J. Olson* and E. Koutsos, California Polytechnic State University, San Luis Obispo.
A novel formula for predicting infectious bursal disease vaccination time based on chick weight rather than age.
A. Vaziry*, D. Venne², D. Frenette¹, and A. Silim¹, ¹Faculté de Médecine Vétérinaire, Université de Montreal, St. Hyacinthe, QB, Canada, ²Couvoir Scott, Scott Jonction, QB, Canada.

Evaluation of Coccivac-B® or Bio-Cox® (salinomycin) for control of field strain Eimeria in broilers on two different feeding programs.
J. T. Lee*¹, C. Broussard², S. Fitz-Coy², P. Burke², N. Eckert¹, S. Stevens¹, P. Anderson¹, and D. J. Caldwell¹, ¹Texas A&M University, College Station, ²Schering-Plough Animal Health, Union, New Jersey.

Evaluation of heterophil function in molting hens fed an alfalfa diet.
J. L. McReynolds*¹, K. J. Genovese¹, H. He¹, J. A. Byrd¹, S. C. Ricke³, D. J. Nisbet¹, and M. H. Kogut¹, ¹USDA-ARS-SPARC, Food & Feed Safety Research Unit, College Station, Texas, ²University of Arkansas, Fayetteville.

Selenium source affects the properties of the anti-Gal natural antibody system in laying hens.
P. Cotter*¹, A. Pescatore³, A. Cantor¹, M. Ford³, T. Ao², and J. Pierce², ¹Framingham State College, Framingham, Massachusetts, ²Alltech, Inc., Nicholasville, Kentucky, ³University of Kentucky, Lexington.

Developing chicken lymphocytes increase glucose metabolism after hatch.
S. Rudrappa and B. Humphrey*, University of Maryland, College Park.
Metabolism and Nutrition

Nutrition - Feeds and Manufacturing
Chair: Michael T. Kidd, Mississippi State University
ETLC 1-001

1:15 PM 99
Effects of marker selection and mix time on coefficient of variation in the mixing process.
P. M. Clark* and K. C. Behnke, Kansas State University, Manhattan.

1:30 PM 100
The effects of cellulose and soy protein isolate on pellet manufacture variables and quality.
N. P. Buchanan*, J. M. Hott, S. E. Cutlip, and J. S. Moritz, West Virginia University, Morgantown.

1:45 PM 101
Effect of steam conditioning practices on pellet quality and growing broiler nutritional value.
S. Cutlip*, J. Hott, N. Buchanan, and J. Moritz, West Virginia University, Morgantown.

2:00 PM 102
Effect of moisture addition with a mold inhibitor on feed manufacture, pellet quality and broiler performance.
J. M. Hott*, N. P. Buchanan, S. E. Cutlip, and J. S. Moritz, West Virginia University, Morgantown.

2:15 PM 103
The effects of whole grains on growth performance, nutrient digestibilities, and cecal short-chain fatty acid production in young chicks.

2:30 PM 104
Increasing the number of phases fed to broiler chickens by blending diets.
R. Currie*1, J. MacIsaac2, and B. Rathgeber3, 1Nova Scotia Agricultural College, Truro, NS, Canada, 2Atlantic Poultry Research Institute, Truro, NS, Canada, 3Agriculture & Agri-Food Canada, Truro, NS, Canada.
2:45 PM 105
Phosphorus bioavailability, TME, and amino acid digestibilities of high protein corn distillers dried grains with solubles and dehydrated corn germ meal.
E. J. Kim*, P. L. Utterback, and C. M. Parsons, University of Illinois, Urbana.

3:00 PM 106
Evaluating by-products of the Atlantic Shellfish Industry as alternative feed ingredients for laying hens.

3:15 PM 107
Corn hybrid kernel trait variation affects broiler chicken growth performance.
S. Moore*, D. Beitz¹, K. Stalder¹, C. Stahl¹, W. Fithian², and K. Bregendahl¹, ¹Iowa State University, Ames, ²Golden Harvest Seeds, Inc., Waterloo, Nebraska.

3:30 PM 108
Corn hybrid kernel trait variation affects laying-hen egg production.
S. Moore*, D. Beitz¹, C. Stahl¹, K. Stalder¹, W. Fithian², and K. Bregendahl¹, ¹Iowa State University, Ames, ²Golden Harvest Seeds, Inc., Waterloo, Nebraska.

3:45 PM 109
Effect of fat and fiber inclusion in the diet on ileal and fecal utilization of nutrients in broiler chicks.
J. M. González–Alvarado*, E. Jiménez–Moreno², A. González–Serrano², R. Lázaro², and G. G. Mateos², ¹Universidad Autónoma de Tlaxcala, México, ²Universidad Politécnica de Madrid, Spain.
1:15 PM  110
Transplantation of chicken ovaries: A breakthrough for germplasm conservation.
Y. Song* and F. G. Silversides, Agriculture and Agri-Food Canada, Agassiz, BC, Canada.

1:30 PM  111
Storage of turkey semen at 4°C for 24h alters the sperm glycocalyx.
J. Peláez and J. Long*, Beltsville Agricultural Research Center, Beltsville, Maryland.

1:45 PM  112
Procalcitonin gene expression in the chicken ovary: Influence of ovarian steroids.

2:00 PM  113
Spontaneously occurring fibroid tumors of the laying hen oviduct.
A. L. Doernte*, M. G. Conner2, M. N. Barnes2, S. H. Oates1, and W. D. Berry1, 1Auburn University, Auburn, Alabama, 2The University of Alabama, Birmingham.

2:15 PM  114
The effect of dietary supplementation of L-carnitine on reproductive traits of White Leghorns.
W. Zhai*1, S. L. Neuman2, M. A. Latour1, and P. Y. Hester1, 1Purdue University, West Lafayette, Indiana, 2Guidant Corporation, St. Paul, Minnesota.

2:30 PM  115
Broiler parent flock age influences embryonic metabolism.
Expression of the mRNA for zona pellucida proteins A, B2, and X in two genetic lines of turkey hens that differ in fertility.

A. P. Benson*1, V. L. Christensen2, B. D. Fairchild1, and A. J. Davis1, 1University of Georgia, Athens, 2North Carolina State University, Raleigh.

Effect of season, hatch time, and post-hatch holding on glycogen status of turkey poults.

J. D. Warner*1, P. R. Ferket1, V. L. Christensen1, and J. V. Felts2, 1North Carolina State University, Raleigh, 2Goldsboro Milling Company, Goldsboro, North Carolina.

Incubation temperature and eggshell conductance effects on the intestinal maturation and thyroid function in commercial turkey poults hatching from a first cycle flock.

S. L. Funderburk*1, V. L. Christensen1, G. G. Campbell2, M. J. Wineland1, J. L. Grimes1, K. M. Mann1, E. R. Neely1, D. T. Ort1, D. V. Rives2, and J. P. McMurtry3, 1North Carolina State University, Raleigh, 2Prestage Farms, Clinton, North Carolina, 3USDA-ARS, Beltsville, Maryland.

Incubation temperature and eggshell conductance effects on intestinal maturation and thyroid function in commercial turkey poults hatching from an induced molted flock.

S. L. Funderburk*1, V. L. Christensen1, G. G. Campbell2, M. J. Wineland1, J. L. Grimes1, K. M. Mann1, E. R. Neely1, D. T. Ort1, D. V. Rives2, and J. P. McMurtry3, 1North Carolina State University, Raleigh, 2Prestage Farms, Clinton, North Carolina, 3USDA-ARS, Beltsville, Maryland.

Processing, Products, and Food Safety

Processing and Products
Chair: Bruce Rathgeber, Agriculture & Agri-Food Canada
NREF 2-001

Modeling broiler growth with Neural Networks using simulated data.

Identifying process variables for a low atmospheric pressure stun/kill system.
J. L. Purswell*, J. P. Thaxton, and S. L. Branton, USDA-ARS Poultry Research Unit, Mississippi State, Mississippi, Mississippi State University, Mississippi State.

Physiology of low atmospheric pressure as a stunning/killing system in broilers.
J. Thaxton*, J. Purswell, and S. Branton, Mississippi State University, Mississippi State, USDA/ARS Poultry Research Unit, Mississippi State, Mississippi.

Impact of age and time of portioning on tenderness of slitted broiler breast fillets.

Optimizing meat tenderness, juiciness and flavor of marinated broiler breast fillets using varying levels of salt.

Marination properties of air chilled and water chilled broiler breast fillets.

Evaluation of smoker oven cooking performance using whole broiler carcasses.

Cathepsin activity in two commercial broiler chicken strains fed supplementary tryptophan.
M. MacKenzie*, J. MacIsaac, and B. Rathgeber, University of Alberta, Edmonton, AB, Canada, Atlantic Poultry Research Institute, Truro, NS, Canada, Agriculture & Agri-Food Canada, Truro, NS, Canada.
Apple by-products as poultry feed ingredients.
C. Ronalds*1, H. P. V. Rupasinghe1, and B. Rathgeber2, 1Nova Scotia Agricultural College, Truro, NS, Canada, 2Agriculture & Agri-Food Canada, Truro, NS, Canada.

Influence of dietary organic and inorganic chromium supplementation on lipid peroxidation and proteolysis in meat of heat-stressed broiler chicks.
M. Toghyani*1, M. Shirazad2, A. Gheisari3, A. Khodami4, and R. Bahadoran1, 1Islamic Azad University, Khorasgan Branch, Esfahan, Iran, 2Islamic Azad University, Science and Research Branch, Tehran, Iran, 3Esfahan Agricultural Research Center, Esfahan, Iran, 4Islamic Azad University, Khorasgan Branch, Esfahan, Iran.

The effect of Tasker Blue on aerobic plate counts and Escherichia coli counts on fresh broiler chicken carcasses.
S. M. Russell*, The University of Georgia, Athens.

POSTER PRESENTATIONS/ MONDAY

Poster Presentations
Chair: Joseph B. Hess and Kevin M. Downs, Auburn University and Middle Tennessee State University

Solarium Metabolism and Nutrition.

M1
Dietary conjugated linoleic acid enhanced spleen PPAR-γ mRNA expression in chicks.
H. J. Zhang, Y. M. Guo*, Y. Yang, and J. M. Yuan, China Agricultural University, Beijing, China.

M2
Effects of dietary cellulose on excreta moisture and egg production in laying hens.
A. Arti* and T. K. Smith, University of Guelph, Guelph, ON, Canada.
M3  
Effect of probiotic on broiler performance and blood factors.  
M. R. Abdollahi* and F. Zaefarian, *Tehran University, Karaj, Tehran, Iran.

M4  
Dietary tocopherols attenuate hepatic triacylglycerol content and cyclooxygenase-2 expression in the cardiac tissue of mtat-Type chickens challenged with lipopolysaccharide.  
G. Cherian*, Z. Ma, and M. P. Goeger, Oregon State University, Corvallis.

M5  
The effect of graded concentrations of a novel thermotolerant xylanase on the performance of laying hens fed wheat/soybean meal-based diets.  
A. J. Cowieson*, A. Knox², and J. McNab², ¹Danisco Animal Nutrition, Marlborough, Wiltshire, United Kingdom, ²Roslin Nutrition, Roslin, Midlothian, United Kingdom.

M6  
Ideal protein based turkey diets result in substantial cost savings.  
J. D. Firman*, University of Missouri, Columbia.

M7  
The effect of grain type and choice-feeding on the performance of organically-reared broiler chickens.  

M8  
Laying hen diets formulated with meat and bone meal and different amino acid digestibility coefficients.  
E. M. Casartelli*, O. M. Junqueira, R. S. Filardi, A. C. Laurentiz, and V. Assuena, Universidade Estadual Paulista/FCAV, Jaboticabal, SP, Brazil.

M9  
Evaluation of guar meal TME using feed-trained roosters.  
O. Gutierrez*, A. Haq, J. C. Wood, and C. A. Bailey, Texas A&M University, College Station.

M10  
Impact of dietary protein levels on growth and body composition of broiler chickens.  
A. D. Mitchell* and R. W. Rosebrough, Growth Biology Laboratory, USDA-Agricultural Research Service, Beltsville, Maryland.
Fate of Cry3Bb1 protein in laying hens fed diets containing MON 863.
S. E. Scheideler1, P. Weber*, K. Sok1, R. E. Hileman2, and G. F. Hartnell3, 1University of Nebraska, Lincoln, 2Monsanto Company, St. Louis, Missouri.

Coconut meal in laying hen diets: Nutrient digestibility, performance and egg quality.

Tibia quality of broilers fed diets with phytase and reduced nonphytate phosphorus levels.
M. C. Oliveira1, R. A. Gravena2, R. H. Marques2, A. B. Traldi2, and V. M. B. Moraes*, 1Universidade de Rio Verde, Rio Verde, GO, Brazil, 2Universidade Estadual Paulista, Jaboticabal, SP, Brazil.

The effect of a novel phytase to improve phosphorus utilization of wheat-based diets.
H. Shah*, M. M. Harris1, C. Fodor1, N. Wall1, A. Smykot1, J. Remus2, and D. R. Korver1, 1University of Alberta, Edmonton, AB, Canada, 2Danisco Animal Nutrition, St. Louis, Missouri.

An examination of the role of dietary protein in regulating metabolism during the broiler finisher period.

The effect of different levels of fat and L-carnitine on performance and serum composition of male broiler chicks.
M. Rezaei*, A. Attar1, A. Ghodratnama2, and H. Kermanshahi3, 1Mazandaran University, Sari, Mazandaran, Iran, 2Center of Khorasan Agricultural Researches, Mashhad, Khorasan, Iran, 3Ferdowsi University, Mashhad, Khorasan, Iran.

The effects of phytase supplemented diets on TME, and sialic acid excretion in female turkeys.
M18
Effect of pelleting temperature and phytase type on phytase survivability and broiler performance.
R. Angel*1, N. Ward2, and A. D. Mitchell3, 1University of Maryland, College Park, 2DSM Nutrition Products, Inc., Parsippany, New Jersey, 3USDA, BARC, Beltsville, Maryland.

M19
The effects of vitamin D supplementation to peak-producing hens fed diets containing different fat source and level on laying performance, metabolic profile, and egg quality.
L. Turgut1, A. Hayirli*2, S. Çelebi1, M. A. Yörük2, M. Gül2, M. Karaoglu1, and M. Macit1, 1Atatürk University, Erzurum, Turkey, 2Atatürk University, Erzurum, Turkey.

M20
Developmental regulation of monosaccharide transporter mRNA in the small intestine of broiler chicks.
E. R. Gilbert*1, H. Li1, D. Emmerson2, K. E. Webb, Jr.'1, and E. A. Wong1, 1Virginia Tech, Blacksburg, 2Aviagen, Huntsville, Alabama.

M21
Morphometry of intestinal mucosa in 21 day-old broiler chickens fed mannan-oligosaccharides and a blend of enzymes.
M. C. Oliveira*1, R. A. Gravena2, R. H. Marques2, L. C. Cancherini2, E. A. Rodrigues2, and V. M. B. Moraes2, 1University of Rio Verde, Rio Verde, GO, Brazil, 2State University of Sao Paulo, Jaboticabal, SP, Brazil.

M22
Effect of supplementing a probiotic feed additive on performance and digestibility of broilers.
J. Sánchez*1, A. Quiles2, A. E. Espinel1, D. Díaz1, and M. I. Gracia1, 1Imasde Agropecuaria S.L., Madrid, Spain, 2Universidad de Murcia, Spain, 3Norel S.A., Madrid, Spain.

M23
Screening of selected probiotic isolates for phytase activity and effects on poultry when fed low phosphorus diets.
A. Torres Rodriguez1, G. Gaona*2, A. Wolfenden2, G. Tellez2, and B. Hargis2, 1Cobb-Vantress, Siloam Springs, Arkansas, 2University of Arkansas, Fayetteville.

M24
High glucose levels in ovo causes damage to embryos.
A. A. Pedroso*, L. S. Chaves, V. T. Barbosa, I. B. Maciel, and C. E. Barbosa, University of Goias, Goiania, Goias, Brazil.
M25
Effects of broiler fed amylase, protease, and xylanase on intestinal enzyme activities.

M26
Maternal dietary conjugated linoleic acid had no adverse effects on progeny development.
V. A. Leone* and M. E. Cook, University of Wisconsin, Madison.

M27
Investigating possible interactions between phytase and xylanase in wheat-based diets for broilers.

M28
Effect of folic acid supplemented diets with and without enzyme on folate deposition in the egg yolk.
T. M. Dickson*, W. Guenter, and J. D. House, University of Manitoba, Winnipeg, MB, Canada.

Processing, Products, and Food Safety.

M29
EU promoted development of a multi-component feed additive for the safe use in poultry production.
V. Klose*, R. Plail, M. Mohnl, S. Nitsch, and G. Schatzmayr, University of Natural Resources and Applied Life Sciences, Tulln, Austria, Biomin GmbH, Herzogenburg, Austria.

M30
The effect of Tasker Blue on shelf-life of fresh broiler chicken carcasses.
S. M. Russell*, The University of Georgia, Athens.

M31
Virtual field trip web site for poultry processing education.

M32
Influence of deboning time on meat quality of broilers processed at two market weights.
M33
Effects of proteolysis on textural properties and water-holding capacity of heat-induced turkey breast meat gels.
X. Li*, Z. Pietrasik, and P. J. Shand, University of Saskatchewan, Saskatoon, SK, Canada.

M34
An assessment of antioxidant and oxidant status in diverse poultry species.

Behavior and Well-Being.

M35
Effects of feeding grains naturally contaminated with fusarium mycotoxins on brain regional neurochemistry of laying hens, turkey poults, and broiler breeder hens.
M. Yegani*1, S. R. Chowdhury1, N. Oinas2, E. J. MacDonald1, and T. K. Smith1, 1University of Guelph, Guelph, ON, Canada, 2University of Kuopio, Kuopio, Finland.

M36
Effects of feeding grains naturally contaminated with fusarium mycotoxins on performance and metabolism of broiler breeders and efficacy of a polymeric glucomannan mycotoxins adsorbent.
M. Yegani*1, T. K. Smith1, S. Leeson1, and H. J. Boermans2, 1University of Guelph, Guelph, ON, Canada, 2University of Guelph, Guelph, ON, Canada.

M37
Bone mineralization in four commercial strains of meat-type chickens.
P. Talaty1, M. N. Katanbaf2, and P. Y. Hester*1, 1Purdue University, West Lafayette, Indiana, 2Cobb-Vantress, Inc., Monticello, Kentucky.

M38
Properly reporting religious slaughter in the scientific literature.

M39
Turkey beak trim and feed form. 1. Effect on turkey performance.
S. L. Noll*1 and H. Xin2, 1University of Minnesota, St. Paul, 2Iowa State University, Ames.
M40  
Turkey beak trim and feed form. 2. Effect on turkey behavior.  
H. Kassube*1, E. Hoerl Leone2, I. Estevez2, H. Xin3, and S. Noll1, 1University of Minnesota, St. Paul, 2University of Maryland, College Park, 3Iowa State University, Ames.

Environment and Management.

M41  
The influence of exercise on the bone mineral density of laying chickens consuming a marginally deficient calcium diet.  
N. P. Johnston*1, G. Aduviri2, R. T. Davidson1, S. Fullmer1, and B. Curfew1, 1Brigham Young University, Provo, Utah, 2University of San Andres, La Paz, Bolivia.

M42  
Differences in light intensity by cage location and tier level affect egg production and quality.  
A. Yildiz, A. Hayirli*, E. Laçin, and M. Macit, Ataturk University, Erzurum, Turkey.

M43  
Efficacy of sodium bisulfate as a litter amendment to reduce paw burns in broiler chickens.  
M. Nagaraj*, J. B Hess, and S. F Bilgili, Auburn University, Auburn, Alabama.

M44  
Improving drag swab detection of Salmonella in broiler litter.  
R. J. Buhr*, L. J. Richardson, J. A. Cason, and N. A. Cox, USDA-ARS Russell Research Center, Athens, Georgia.

M45  
Influence of housing system, grain type and particle size on Salmonella colonization and shedding in broilers fed triticale- and corn-soybean meal diets.  
F. Santos*, A. Santos, Jr, P. Ferket, and B. Sheldon, North Carolina State University, Raleigh.

Genetics.

M46  
Cytogenetic telomere array profile analysis comparing different chicken genotypes.  
T. H. O’Hare* and M. E. Delany, University of California, Davis.
M47
Understanding eggshell matrix protein genes for improvements in shell quality.

M48
Pedigree and microsatellite marker analyses are comparable methods for estimating inbreeding in an inbred strain of Japanese Quail.
S. H. Kim*, K. M. Cheng1, C. Ritland1, K. Ritland1, and F. G. Silversides2, 1University of British Columbia, Vancouver, BC, Canada, 2Agriculture and Agri-food Canada, Agassiz, BC, Canada.

M49
Physiology, Endocrinology, and Reproduction.

M49
Microarray analysis of gene expression patterns in the anterior pituitary of chickens genetically selected for high and low body weight.
L. E. Ellestad*, M. S. Byerly1, J. Simon2, L. A. Cogburn1, E. Le Bihan-Duval2, and T.E. Porter1, 1University of Maryland, College Park, 2INRA, Nouzilly, France, 1University of Delaware, Newark.

M50
Developmental expression of preproghrelin, GHS-R, and GPR-39 in the small intestine of chickens divergently selected for high or low juvenile body weight.
C. R. Miller*, P. B. Siegel, K. E. Webb, Jr., and E. A. Wong, Virginia Tech, Blacksburg.

M51
Identification of differentially expressed genes in pituitary glands of day 24 turkey embryos following stimulation with VIP.
M-K. Ho1, B. Leclerc1, D. Zadworny*, N. Kansaku2, and U. Kuhnlein1, 1McGill University, Montreal. QC, Canada, 2Azabu University, Fuchinobe, Sagamihara, Japan.

M52
Antimicrobial activity of the anseriform outer eggshell.
O. W. Labadie*, J. Picman1, and M. T. Hincke2, 1University of Ottawa, Ottawa, ON, Canada, 2University of Ottawa, Ottawa, ON, Canada.
M53
Ovocalyxin-36 is a novel chicken eggshell protein related to lipopolysaccharide-binding proteins (LBP) bactericidal permeability-increasing proteins (BPI), and Plunc family proteins.

J. Gautron¹, Y. Nys¹, M. D. McKee², and M. Hincke³, ¹Station de Recherche Avicoles, INRA, Nouzilly, France, ²McGill University, Montreal, QC, Canada, ³University of Ottawa, Ottawa, ON, Canada.

Pathology.

M54
Diversity and relationship among APEC within the GI tract and APEC of diseased turkey poults.


M55
Characterization of Extraintestinal Invasive Escherichia coli (ExIEC) strains isolated from a Mexican Poultry Integration.

C. Rosario*¹ and C. Eslava², ¹Universidad Nacional Autonoma de Mexico, Mexico, ²Universidad Nacional Autonoma de Mexico, Mexico.
General Environmental Effects on Poultry
Chair: Nicholas G. Zimmermann,
University of Maryland
ETLC 1-013

8:00 AM  131
Including corn distiller’s dried grains with solubles, wheat middlings, or soybean hulls in laying-hen diets lowers manure ammonia emission.
S. Roberts*, H. Xin, B. Kerr, J. Russell, and K. Bregendahl, Iowa State University, Ames.

8:15 AM  132
The use of an urease inhibitor to control ammonia release from layer manure.
W. D. King*, A. J. Pescatore, A. Singh, R. S. Gates, K. D. Casey, M. J. Ford, and A. H. Cantor, University of Kentucky, Lexington, University of Kentucky, Lexington, Texas Agricultural Experiment Station, Texas A&M University, Amarillo.

8:30 AM  133
Determination of the nitrogen budget of commercial broilers raised from 0 to 42 days of age.
L. Mitran*, J. Harter-Dennis, J. Timmons, and J. Meisinger, University of Maryland Eastern Shore, Princess Anne, USDA-ARS, Beltsville, Maryland.

8:45 AM  134
Superabsorbent polymers as a poultry litter amendment.
J. R. Timmons* and J. M. Harter-Dennis, University of Maryland Eastern Shore, Princess Anne, Maryland.

9:00 AM  135
Reducing broiler air emissions through diet.
W. Powers*, R. Angel, S. Zamzow, and T. Applegate, Iowa State University, Ames, University of Maryland, College Parks, Purdue University, West Lafayette.

9:15 AM  136
Percent carbon and C:N of broiler litter and cake over consecutive flocks.
C. D. Coufal*, A. D. Collins, and J. B. Carey, Mississippi State University, Starkville, Texas A&M University, College Station.
9:30 AM 137
Potential for reducing manure mineral levels of trace minerals by using low levels of dietary mineral proteinates. A. E. Sefton*1 and S. Leeson2, 1Alltech Canada, Guelph, ON, Canada, 2University of Guelph, Guelph, ON, Canada.

9:45 AM 138
Humoral immunity of chickens in different housing environments. H. Karami* and H. Sunwoo, University of Alberta, Edmonton, AB, Canada.

10:00 AM
Break.

10:15 AM 139
Viable chicken egg assay used to evaluate metabolites of the herbicide Diuron. T. Carro*1, V. Gaddamidi2, S. W. Bookhart, III2, M. E. Persia1, and W. W. Saylor1, 1University of Delaware, Newark, 2DuPont Ag Products, Inc., Newark, Delaware.

10:30 AM 140
The effect of L-arginine supplement on intestinal nitric oxide and microflora of broilers. M. Putsakum*, L. L. McWilliams, Y. V. Thaxton, J. P. Thaxton, A. Corzo, and S. W. Anderson, Mississippi State University, Starkville.

10:45 AM 141

11:00 AM 142
Assessing the performance of an actively heated and ventilated broiler transport prototype. S. L. Cochran, K. P. C. Hui*, T. G. Crowe, K. Bligh, H. L. Clas- sen, and E. M. Barber, University of Saskatchewan, Saskatoon, SK, Canada.

11:15 AM 143
Timing of photostimulation affects female broiler breeder carcass and reproductive traits at sexual maturity. A. Naeima*, R. A. Renema, A. Pishnamazi, and F. E. Robinson, University of Alberta, Edmonton, AB, Canada.
Effects of a reduction of dietary crude protein on performance and economics in commercial Ross 308 broilers.


Influence of grower period length and amino acid level in the finisher period on broiler performance and economics.


Improved performance of Cobb 500 birds fed increased amino acid density in wheat or maize based diets.

R. B. Shirley*, D. S. Parker, M. Vazquez-Anon, C. D. Knight, and A. G. Marangos, 1Novus International, Inc., St Louis, Missouri, 2Nutrition Solutions, Winchester, United Kingdom.

Individual arginine requirements in Ross 308 broilers at 7, 21 and 42 days of age.

R. A. Coleman*, R. D. Kirschenman, S. Moehn, and D. R. Korver, 1University of Alberta, Edmonton, AB, Canada, 2University of Queensland, Gatton, Queensland, Australia.

Comparison of endogenous ileal amino acid and total nitrogen flow in turkey pouls and broiler chicks.

S. A. Adedokun*, C. Parsons, M. Lilburn, O. Adeola, and T. J. Applegate, 1Purdue University, West Lafayette, Indiana, 2University of Illinois, Urbana, 3The Ohio State University, Columbus.
Standardized ileal amino acid digestibility of meat and bone meal in broiler chicks using a nitrogen-free or casein diet.
S. A. Adedokun*, 1, C. Parsons2, M. Lilburn3, O. Adeola1, and T. J. Applegate1, 1Purdue University, West Lafayette, Indiana, 2University of Illinois, Urbana, 3The Ohio State University, Columbus.

Responses of fast and slow growth rate female broiler griller to all vegetable diets with graded increases in the ideal protein profile.

Responses of fast and slow growth rate male broilers to all vegetable diets with graded increases in the ideal protein profile.

Changes in tissue accretion during the acute phase response.
P. Sirimongkolkasem* and K. C. Klasing, University of California, Davis.

The effects of different nutrient regimes on Ross broilers during stress and post-stress recovery.
W. S. Virden*, A. C. DeLeon, A. Corzo, and M. T. Kidd, Mississippi State University, Mississippi State.

Developmental regulation of peptide and amino acid transporter mRNA in the small intestine of broiler chicks.
E. R. Gilbert*, 1, H. Li1, D. Emmerson2, E. A. Wong1, and K. E. Webb, Jr. 1, Virginia Tech, Blacksburg, 2Aviagen, Huntsville, Alabama.
Intestinal *Clostridium perfringens* and lactobacilli populations in broiler chickens fed protected glycine and proline based diets.

J. P. Dahiya*, D. Hoehler, A. G. Van Kessel, and M. D. Drew, 1University of Saskatchewan, Saskatoon SK, Canada, 2Degussa Corporation, Kennesaw, Georgia.

Effect of low protein diets on necrotic enteritis in broiler chickens.

T. E. Warren*, D. C. Wilkie, J. P. Dahiya, A. G. Van Kessel, D. Hoehler, and M. D. Drew, 1University of Saskatchewan, Saskatoon SK, Canada, 2Degussa Corporation, Kennesaw, Georgia.

An examination of the role of feeding regimens in regulating metabolism during the broiler breeder grower period.

M. de Beer*, C. N. Coon, R. W. Rosebrough, B. A. Russel, S. M. Poch, and M. P. Richards, 1University of Arkansas, Fayetteville, 2USDA-ARS, Beltsville, Maryland.
P. W. Plumstead*1, A. B. Leytem2,1, R. O. Maguire1, E. Oviedo1, and J. T. Brake1, 1North Carolina State University, Raleigh, 2USDA-ARS, Kimberly, Idaho.

Studies of the effects of adding a combination of dietary Ca, 1alpha-OH cholecalciferol, and phytase to a diet deficient in available phosphorus.
A. Liem*, G. M. Pesti, and H. M. Edwards Jr., University of Georgia, Athens.

Incorporation of wheat middlings, citric acid, and phytase in a corn soybean meal diet: Effects on phosphorus utilization and growth in the grower and finisher phases.
T. O’Connor-Dennie* and J. L. Emmert, University of Arkansas, Fayetteville.

The effect of dietary Ca and P content on the relative performance of Quantum phytase with that of a fungal phytase.

Effect of different phytase sources on broiler performance and yield when added to the mixer and pelleted at two temperatures.

Dietary phytase activities and the efficiency of energy utilisation in chickens.
V. Pirgozliev*1, P. Mares2, T. Acamovic1, and M. R. Bedford3, 1ASRC, Scottish Agricultural College, Edinburgh, Scotland, United Kingdom, 2Mendel University of Agriculture and Forestry, Brno, Czech Republic, 3Syngenta Animal Nutrition Inc., Marlborough, Wiltshire, England, United Kingdom.
10:15 AM  166
Broiler performance on phytase-supplementsed defatted rice bran diet during heat stress.
M. O. Smith*1 and O. Pumimm2, 1The University of Tennessee, Knoxville, 2Kasetsart University, Kamphaengsaen, Nakom Pathom, Thailand.

10:30 AM  167
Manipulation of dietary calcium, phosphorus, and phytase in broilers. 2. Effects on total and soluble phosphorus excretion.
A. B. Leytem*2,1, P. W. Plumstead1, R. O. Maguire1, E. Oviedo1, and J. T. Brake1, 1North Carolina State University, Raleigh, 2USDA-ARS, Kimberly, Idaho.

10:45 AM  168
Effects of varied levels of dietary nonphytate P and Ca on P excretion and relationship between plasma inorganic P and urinary excretion of P in broilers.
M. K. Manangi* and C. N. Coon, University of Arkansas, Fayetteville.

11:00 AM  169
Apparent ileal digestibility and total tract nutrient retention of chickens receiving a cocktail of carbohydrases and protease or phytase individually or in combination.
O. A. Olukosi*1, A. J. Cowieson2, and O. Adeola1, 1Purdue University, West Lafayette, Indiana, 2Danisco Animal Nutrition, Marlborough, Wiltshire, United Kingdom.

11:15 AM  170
Performance parameters and egg ω-3 fatty acids content in laying hens fed flaxseed diets without or with enzyme supplementation.
W. Jia*1, B. A. Slominski1, W. Guenter1, A. Humphreys2, and O. Jones3, 1University of Manitoba, Winnipeg, MB, Canada, 2Maple Leaf Animal Nutrition, Winnipeg, MB, Canada, 3Canadian Bio-systems Inc., Calgary, Canada.

11:30 AM  171
Energy releasing effect of an alpha amylase - beta glucanase blend in all vegetable corn soy diets for broiler.
A. G. Bertechini*1, S. L. Vieira2, J. C. Carvalho3, J. A. G. Brito1, and G. O. Figueiredo1, 1UFL, Lavras, MG, Brazil, 2UFRGS, Porto ALegre, RS, Brazil.
Physiology, Endocrinology, and Reproduction

Physiology
Chair: John A. Proudman, USDA/ARS
NREF 2-003

8:00 AM 172
Can a novel lighting program for turkey breeder hens delay the expression of photorefractoriness and boost late-season egg production?
J. A. Proudman* and T. D. Siopes, USDA-ARS, Beltsville, Maryland, University of North Carolina, Raleigh.

8:15 AM 173
Can typical poor egg production by turkeys during the summer be accounted for by insufficient lighting and reduced photoperiodic drive?
T. D. Siopes*, North Carolina State University, Raleigh.

8:30 AM 174
Effect of eyes on reproduction in Formoguanamine injected male chicks.
T. Rathinam*, Y. Obara, J. A. Proudman, and W. J. Kuenzel, University of Arkansas, Fayetteville, Meijo University, Nagoya, Japan, USDA/ARS/BGPL, Beltsville, Maryland.

8:45 AM 175
The role of the retinal and extra retinal photoreceptors in reproductive activities of broiler breeder hens.
I. Rozenboim*, N. Mobarkey, and M. E. El Halawani, Hebrew University of Jerusalem, Rehovot, Israel, University of Minnesota, St. Paul.

9:00 AM 176
Effect of arginine on blood gases, acid–base balance and plasma corticosterone in broilers.
L. L. Hale-McWilliams*, M. Putsakum, S. W. Anderson, A. Corzo, Y. Vizzier-Thaxton, and J. P. Thaxton, Mississippi State University, Mississippi State.
9:15 AM  177

Transcriptional analysis of the liver in juvenile broiler chickens divergently selected for high or low body weight.
N. Trakooljul*1, W. Carré1, X. Wang1, R. J. Tempelman2, E. Le Bihan-Duval3, M. Duclos1, J. Simon5, T. E. Porter4, and L. A. Cogburn1, 1University of Delaware, Newark, 2Michigan State University, East Lansing, 3Station de Recherché Avicoles, INRA, Nouzilly, France, 4University of Maryland, College Park.

9:30 AM  178

Inosine ameliorates the effects of hemin induced oxidative stress in broilers.
C. N. Seaman*1, G. Casotti2, E. A. Falkenstein1, J. S. Moritz1, K. Van Dyke1, and H. Klandorf1, 1West Virginia University, Morgantown, 2West Chester University, West Chester, Pennsylvania.

9:45 AM  179

Patho-physiological changes associated with rapid growth in commercial broilers.
S. Nain*, B. Laarveld, and A. A. Olkowski, University of Saskatchewan, Saskatoon, SK, Canada.

10:00 AM

Break.

10:15 AM  180

Effect of feeding program during rearing and onset of lay on reproductive performance of broiler breeder females.
N. Leksrisompong*, P. W. Plumstead, H. Romero-Sanchez, and J. T. Brake, North Carolina State University, Raleigh.

10:30 AM  181

The effects of skip-a-day feeding during the early lay period on reproductive physiology in broiler breeder hens.
L. C. Gibson*, A. J. Davis, and J. L. Wilson, University of Georgia, Athens.

10:45 AM  182

Changes in the microbiota populations and gastrointestinal tract development of the jejunum and ileum.
B. S. Lumpkins*, A. B. Batal, and M. D. Lee, University of Georgia, Athens.

11:00 AM  183

Bone fracture incidence in high-producing non-commercial laying hens identified using radiographs.
W. D. Clark*, W. R. Cox2, and F. G. Silversides1, 1Agriculture and Agri-Food Canada, Agassiz, BC, Canada, 2Canadian Animal Health Management Services Ltd., Chilliwack, BC, Canada.
Increased internal radiodensity of humeri in high-producing non-commercial laying hens.
W. D. Clark*, 1, W. R. Cox, and F. G. Silversides, 1 
Agriculture and Agri-Food Canada, Agassiz, BC, Canada, 
2 Canadian Animal Health Management Services Ltd., Chilliwack, BC, Canada.

Processing, Products, and Food Safety Chair: Phyllis Shand, University of Saskatchewan NREF 2-001

Broiler Microbiology.

Effect of combining antimicrobial treatments with in-package pasteurization for control of Listeria monocytogenes in ready-to-eat turkey bologna.
S. Mangalassary*, I. Y. Han, J. Rieck, and P. L. Dawson, Clemson University, Clemson, South Carolina.

Comparison of poultry processing conveyor belts for susceptibility to bacterial attachment and biofilm formation.
S. Pitchiah*, C. Z. Alvarado, and M. M. Brashears, Texas Tech University, Lubbock.

Effect of alkaline scald conditions on Salmonella or Campylobacter recovery during commercial turkey processing.
S. M. Stevens*, 1 J. A. Byrd, 2 A. P. McElroy, 1 S. M. Anderson, 1 D. J. Nisbet, 2 and D. J. Caldwell, 1 Texas A&M University, College Station, 2 USDA-ARS-SPARC, College Station, Texas, 3 Virginia Tech, Blacksburg.

Effect of a high level chlorine rinse on the recovery of Salmonella and enumeration of bacteria from broiler carcasses.
L. N. Bartenfeld*, 1 D. L. Fletcher, 1 and J. K. Northcutt, 2 The University of Georgia, Athens, 2 USDA-ARS, Athens, Georgia.

Reduction of Campylobacter spp on poultry carcasses using various interventions under simulated industry conditions.
EU promoted research towards zootechnical feed additives for the safe use in poultry production.
V. Klose*1, R. Plail1, M. Mohnl2, S. Nitsch2, and G. Schatzmayr2, 1University of Natural Resources and Applied Life Sciences, Tulln, Austria, 2Biomin GmbH, Herzogenburg, Austria.

Egg yolk antibody efficacy test I: The growth inhibition of Clostridium perfringens vegetative cells and spores in vitro.

Rapid and specific real-time polymerase chain reaction method for detection of viable Salmonella species in poultry feed and feedstuff.
X. Li*, J. Caldwell, and J. Levine, North Carolina State University, Raleigh.

Destruction of Salmonella enteritidis and quality of table shell eggs using microwave commercial sterilization.
D. Lakins*, A. Echeverry, C. Alvarado, M. Brashears, and L. Thompson, Texas Tech University, Lubbock.

Effects of cool water washing of shell eggs on Haugh unit, vitelline membrane strength, aerobic bacteria, yeast, and mold.
A. B. Caudill*1, P. A. Curtis1, D. R. Jones2, M. T. Musgrove2, K. E. Anderson3, and L. K. Kerth1, 1Auburn University, Auburn, Alabama, 2USDA Russell Research Center, Athens, Georgia, 3North Carolina State University, Raleigh.
Influence of hen age and molting treatments on shell egg exterior, interior, and contents; microflora and *Salmonella* prevalence during a second production cycle.
V. Kretzschmar-McCluskey*, P. A. Curtis¹, K. E. Anderson², L. K. Kerth¹, and O. A. Oyarzabal¹, *Auburn University, Auburn, Alabama, North Carolina State University, Raleigh.

Impact of white and brown-egg layer strains and molt on size distribution, and egg quality during the second production cycle.
K. E. Anderson*, L. K. Kerth², V. Kretzschmar-McCluskey², and P. A. Curtis², North Carolina State University, Raleigh, *Auburn University, Auburn, Alabama.

Feeding White Leghorn hens yeast beta-glucans to influence egg quality.
N. McKillop*, J. MacIsaac², and B. Rathgeber³, Nova Scotia Agricultural College, Truro, NS, Canada, Atlantic Poultry Research Institute, Truro, NS, Canada, Agriculture & Agri-Food Canada, Truro, NS, Canada.

The relationship between egg storage time and functionality in sponge cakes.

The effect of egg storage time on custard functionality.
A. Davis*, P. Curtis, and L. Kerth, Auburn University, Auburn, Alabama.
Behavior and Well-Being
Chair: James C. Hermes, Oregon State University
NREF 1-001

8:30 AM 200
Behaviour and welfare of laying hens in conventional and modified battery cages.
M. J. Jendral*, J. S. Church², and J. J. R. Feddes¹, ¹University of Alberta, Edmonton, AB, Canada, ²Alberta Agriculture, Food and Rural Development, Edmonton, AB, Canada.

8:45 AM 201
Benefits of environmental complexity for broiler breeders.

9:00 AM 202
Development of a high-throughput modified atmosphere chamber for the on-farm euthanasia of spent hens.

9:15 AM 203
Barley silage effects on laying hen behaviour.
S. G. Johannson*, K. V. Schwean-Lardner, and H. L. Classen, University of Saskatchewan, Saskatoon, SK, Canada.

9:30 AM 204
The effect of daylength on the behaviour of broiler chickens.
K. Schwean-Lardner*, H. L. Classen¹, and B. I. Fancher², ¹University of Saskatchewan, Saskatoon, SK, Canada, ²Aviagen Inc., Huntsville, Alabama.

9:45 AM 205
Effect of photoperiod on mobility and leg defects in broilers.
K. Schwean-Lardner*, H. L. Classen¹, and B. I. Fancher², ¹University of Saskatchewan, Saskatoon, SK, Canada, ²Aviagen Inc., Huntsville, Alabama.

10:00 AM
Break.

10:15 AM 206 - Moved to Welfare Symposium
Neurobiological basis of sensory perception: Welfare implications of beak trimming in poultry.
W. J. Kuenzel*, University of Arkansas, Fayetteville.
10:30 AM  
Relationship between body weight and beak characteristics in 1 d old layer chicks.  
A. G. Fahey*1,2, R. M. Marchant-Forde2, and H. W. Cheng1,  
1Purdue University, West Lafayette, Indiana, 2USDA, West Lafayette, Indiana.

10:45 AM  
Infrared beak treatment: Part I, Comparative effects of infrared and 1/3 hot-blade trimming on beak topography and growth.  

11:00 AM  
Infrared beak treatment: Part II, Comparative effects of infrared and 1/3 hot-blade trimming on behavior and feeding ability.  

11:15 AM  
Infrared beak treatment: Part III, Comparative effects of infrared and 1/2 hot-blade trimming on beak topography and growth.  
POSTER PRESENTATIONS/TUESDAY

Chair: Joseph B. Hess and Kevin M. Downs, Auburn University and Middle Tennessee State University
Solarium

Metabolism and Nutrition.

T1
In ovo feeding of glutamine to chicks.

T2
The effect of Glutamine or Glutamic acid supplementation in combination with antibiotics on the growth performance of broiler chickens.

T3
Dried porcine solubles (DPS) and coccidiosis vaccines on morphometric parameters in lower intestine.
P. H. D. Tomasi and J. L. Andriguetto*, Universidade Federal do Paraná, Curitiba, Paraná, Brazil.

T4
Efficacy of probiotic supplementation in broiler diets.

T5
Evaluation of a mineral chelate for late-cycle laying hens.
J. L. MacIsaac*, D. M. Anderson2, S. J. Butt2, and B. Rathgeber3, 1Atlantic Poultry Research Institute, Truro, NS, Canada, 2Nova Scotia Agricultural College, Truro, NS, Canada, 3Agriculture & Agri-Food Canada, Truro, NS, Canada.

T6
Effect of oligofructose and inulin on calcium and phosphorus content in tibia bone of growing broiler chickens.
T7
Effect of mannan oligosaccharides and enzymes on antibody titers against Gumboro.
M. C. Oliveira¹, D. F. Figueiredo², D. E. Faria Filho², L. C. Cancaneri², R. A. Gravena², and V. M. B. Moraes*², ¹Universidade de Rio Verde, Rio Verde, GO, Brazil, ²Universidade Estadual Paulista, Jaboticabal, SP, Brazil.

T8
Availa®Zn and Availa®Mn improve performance and intestinal strength of broilers fed plant-based diets.
S. Davis¹, T. Cheng*, and T. Ward², ¹Colorado Quality Research, Wellington, Colorado, ²Zinpro Corporation, Eden Prairie, Minnesota.

T9
Effect of sodium chloride (NaCl) in drinking water on performance and eggshell quality in Hy-Line laying hens.
H. Collazos*, L. Barrantes, and J. Barbudo, Universidad Nacional Abierta y a Distancia-UNAD, Bogota, Cundinamarca, Colombia.

T10
Influence of source and particle size of fibrous ingredients on performance of broilers.

T11
Influence of β-mannanases on the metabolizable energy and performance of broilers fed nutritionally marginal corn-soy diets.
H. Schulze*,¹, V. Ravindran², and P. J. Moughan³, ¹Danisco Animal Nutrition, Leiden, The Netherlands, ²Institute of Food, Nutrition and Human Health, Palmerston North, New Zealand, ³Riddet Centre, Massey University, Palmerston North, New Zealand.

T12
The effect of vitamins supplementation on broiler breeder performance, hatchability, and methionine metabolism in 18 day-old chick embryos.
J. W. Lu* and C. N. Coon, University of Arkansas, Fayetteville.

T13
Effects of method of whole wheat feeding on the performance and gizzard development of broiler chickens.
A. Amerah, V. Ravindran*, R. G. Lentle, and D. G. Thomas, Massey University, Palmerston North, New Zealand.
T14  
Effect of an evolved thermo-tolerant phytase on performance and bone ash in broiler chickens.  
R. Angel*1 and C. Wyatt2, 1University of Maryland, College Park, 2Syngenta Animal Nutrition, Research Triangle Park, North Carolina.

T15  
Long term feeding of conjugated linoleic acid and fish oil to laying hens: Effects on egg quality, production performance, tissue fatty acids and hen liver pathology.  

T16  
Effect of different levels of pigment and sources of fat with or without enzyme on egg yolk color and performance of laying hens.  
F. Zaefarian*, M. Shivazad, and M. Abdollahi, Tehran University, Karaj, Iran.

T17  
Effect of xylanase or xylanase, amylase and protease in combination with phytase on the nutritional value of a corn/soy-based diet for growing broiler chickens.  
A. J. Cowieson*1, N. K. Sakomura2, N. A. A Barbosa2, and M. Hruby1, 1Danisco Animal Nutrition, Marlborough, Wiltshire, United Kingdom, 2Faculdade de Ciências Agrarias e Veterinarias, UNESP, Jaboticabal, São Paulo, Brazil.

T18  
Effect of xylanase or xylanase, amylase and protease in combination with phytase on corn/soy-based diet for growing broiler chickens.  
N. K Sakomura*1, N. A. A. Barbosa1, A. J. Cowieson2, and M. Hruby2, 1Faculdade de Ciências Agrarias e Veterinarias, UNESP, Jaboticabal, São Paulo, Brazil, 2Danisco Animal Nutrition, Marlborough, Wiltshire, United Kingdom.

T19  
Effect of fructooligosaccharides and inulin on intestinal bacteria and pathogens in cecal contents from broiler chickens.  
F. Tuz-Dzib*1, L. Reyes-Gonzalez2, L. Garcia-Andrade1, D. Ortega-Alvarez1, L. M. Guerrero1, and G. M. Ruiz-Palacios1, 1National Institute of Medical Science and Nutrition, Mexico City, Mexico, 2Megafarma, Mexico City, Mexico.

T20  
Effects of lipopolysaccharide dosage and injection frequency on broiler performance and organ weights.  
P. Sirimongkolkasem* and K. C. Klasing, University of California, Davis.
T21
Comparative thermostability of phytase products in pelleted feeds.
N. E. Ward*1, D. Campbell1, and A. Korsbak2, 1DSM Nutritional Products Inc., Parsippany, New Jersey, 2DSM Nutritional Products Inc., Oerbaek, Denmark.

T22
Production performance of Pearl Grey guinea fowl pullets fed diets with varying concentrations of dietary metabolizable energy and crude protein.
S. N. Nahashon*, N. Adefope, A. Amenyenu, and D. Wright, Institute of Agricultural and Environmental Research, Tennessee State University, Nashville.

T23
Keratinase supplementation in the soybean and cottonseed meal containing diet improves growth performance and nutrient digestibility of broiler chickens.
H. Y. Wang1, Y. M. Guo*1, and J. C. H. Shih2, 1China Agricultural University, Beijing, China, 2North Carolina State University, Raleigh.

T24
Developmental gene expression of nutrient transporters in the small intestine of chickens divergently selected for high or low juvenile body weight.
C. R. Miller*, P. B. Siegel, K. E. Webb, Jr., and E. A. Wong, Virginia Tech, Blacksburg.

T25
The effects of dietary copper source and concentration on chick growth, tissue copper concentrations, mucosal copper and iron mineral transporters and copper excretion.
J. H. Skaggs*1, M. E. Persia1, B. D. Humphrey2, and W. W. Saylor1, 1University of Delaware, Newark, 2University of Maryland, College Park.
T26
The effect of feeding quinoa on the Omega-3 PUFA contents of chicken eggs.

T27
Bleed-out and mechanical carcass washing impact on chiller water color, pH, chlorine level and carcass bacteria.
D. L. Brinson, R. J. Buhr*, and J. K. Northcutt, USDA-ARS, Russell Research Center, Athens, Georgia, The University of Georgia, Athens.

T28
Nutritional composition of grilled and raw enhanced or non-enhanced chicken breast fillets.
J. Kiker*, J. Howe, J. Holden, C. Alverado, J. Boyce, A. Luna, and L. Thompson, Texas Tech University, Lubbock, Beltville Human Nutrition Research Center, Beltville, Maryland.

T29
Nutritional composition of two flavors of rotisserie chicken obtained from four regions of the United States.

T30
Comparative anti-bacterial activity of egg white protein extracts from domestic chicken, turkey, duck and goose.
O. W. Labadie*, J. Picman, and M.T. Hincke, University of Ottawa, Ottawa, ON, Canada, Department of Cellular and Molecular Medicine, University of Ottawa, Ottawa, ON, Canada.

T31
Development of a direct fed microbial to control pathogens associated with turkey poult production.
Where molecular pathogenesis and NMR spectroscopy collide: An integrated approach towards the development of a CPS–based therapy for *Campylobacter jejuni*.

D. J. McNally¹, H. C. Jarrell¹, M. Lamoureux¹, R. A. Coleman²*, A. V. Karlyshev², B. W. Wren², J–R. Brisson¹, and C. M. Szymanski¹, ¹NRC Institute for Biological Sciences, Ottawa, ON, Canada, ²The London School of Hygiene and Tropical Medicine, London, United Kingdom.

Novel method for rapid construction of *Campylobacter jejuni* deletion mutants.

C. Hansen* and Y. M. Kwon, University of Arkansas, Fayetteville.


T. Schaal* and G. Cherian, Oregon State University, Corvallis.

The efficacy of nipple drinkers and a direct-fed microbial on large white commercial turkey performance.

S. M. Russell* and J. L. Grimes, North Carolina State University, Raleigh.

The influence of probiotics combined with mushroom extract on broiler chickens performance.


Evaluation of drinking water or post-pelleting feed application of a *Lactobacillus*-based probiotic on broiler performance.

N. Eckert*, D. Hyatt, J. Lee, S. Stevens, P. Anderson, S. Anderson, and D. Caldwell, Texas A&M University, College Station.

In house composting and its effect on foodborne pathogens.

The effect of quicklime (CaO) on litter condition and broiler productivity.

V. Ruiz1, D. Ruiz1, A. G. Gernat*, J. L. Grimes2, J. G. Murillo1, M. J. Wineland2, K. E. Anderson3, and R. Maguire3, 1Escuela Agrícola Panamericana, Zamorano, Tegucigalpa, Honduras, 2North Carolina State University, Raleigh, 3North Carolina State University, Raleigh.

Effect of drinking water coliform on broiler performance.

P. Sedlacek*, A. B. Batal, B. D. Fairchild, and C. W. Ritz, University of Georgia, Athens, Georgia.

Genetics.

Association of IL-10 gene clusters and Salmonella response in chicken.

S. B. Ghebremicael1,2, J. R. Hasenstein1, and S. J. Lamont*, 1Iowa State University, Ames, 2Wageningen University, Wageningen, The Netherlands.

A database for chicken full-length cDNAs.

Y Wang, Z. G. Wang, and F.C. Leung*, Department of Zoology, The University of Hong Kong, Hong Kong.

Physiology, Endocrinology, and Reproduction.

Characterization of Duck Pit-1 cDNA and genomic DNA.

N. Kansaku*, T. Ohkubo2, D. Guemene3, U. Kuhnlein4, and D. Zadworny4, 1Azabu University, Sagamihara, Kanagawa, Japan, 2Kagawa University, Miki-Cho, Kagawa, Japan, 3INRA-SRA, Nouzilly, France, 4McGill University, Ste. Anne de Bellevue, PQ, Canada.

Cloning and expression of chicken AMP-activated protein kinase subunit genes.

M. Proszkowiec-Weglarz, M. P. Richards*, and S. M. Poch, USDA, ARS, ANRI, Growth Biology Laboratory, Beltsville, Maryland.
Gastrointestinal maturation is accelerated in turkey poults supplemented with a mannan-oligosaccharide yeast extract (Alphamune™).

F. Solis de los Santos*1, M. B. Farnell2, A. M. Donoghue3, G. R. Huff3, W. E. Huff3, N. C. Rath3, and D. J. Donoghue1,

1University of Arkansas, Fayetteville, 2Texas A & M University, College Station, 3Poultry Prod Agriculture Research Service, USDA, Fayetteville, Arkansas.

Adrenal hormones play important roles to tolerate acute heat stress in broilers.


Study of the effects of dietary lutein on semen parameters in roosters.

H. Pizzey* and G. Y. Bedecarrats, University of Guelph, Guelph, ON, Canada.

3β-HSD and cAMP in GC of hens subjected to heat stress.

H Taira* and M. M. Beck, University of Nebraska, Lincoln.

Effect of blindness on reproductive performance in a White Leghorn chicken line.

P. M. Kirby* and G. Y. Bedecarrats, University of Guelph, Guelph, ON, Canada.

Effects of thermal stress during incubation on some embryo physiological parameters.

R. D. Malheiros*1, V. M. B. Moraes2, M. Macari2, J. Buyse3, and E. Decuyper3, 1Universidade Estadual Paulista-UNESP, Dracena, SP-Brazil, 2Universidade Estadual Paulista- UNESP, Jaboticabal, SP-Brazil, 3Lab for Livestock Physiology and Immunology-KUL, Leuven, Belgium.
Characterization of *Clostridium* from broiler farms experiencing recurrent outbreaks of gangrenous dermatitis.


Natural presence of *Campylobacter* and *Salmonella* in the spleen, liver/gallbladder and reproductive tract of commercial Leghorn laying hens.

N. A. Cox, R. J. Buhr*, M. T. Musgrove, L. J. Richardson, and P. J. Fedorka-Cray, 1USDA-ARS-PMSRU-Russell Research Center, Athens, Georgia, 2USDA-ARS-ESQRU-Russell Research Center, Athens, Georgia, 3USDA-ARS-BEAR-Russell Research Center, Athens, Georgia.

Real time PCR for the rapid detection of avian reoviruses.

K. Guo*, J. Giambrone, T. Dormitorio, and H. Wu, 1Auburn University, Auburn, Alabama, 2Alabama State University, Montgomery.

Sequence analysis of the infectious bursal disease virus VP2 gene from commercial chickens from Nigeria.

O. A. Fagbohun, J. J Giambrone, T. V Dormitorio, W. Honolulu, and K. Guo, 1Auburn University, Auburn, Alabama, 2Auburn University, Auburn, Alabama, 3Alabama State University, Montgomery.

Identification of *Salmonella enteritidis* genes essential for in vitro growth by TnAraOut mutagenesis.

J. N. Kim*, G. W. Youm, and Y. M. Kwon, 1University of Arkansas, Fayetteville, 2University of Arkansas, Fayetteville.

Evaluation of spray application of a *Lactobacillus* -based probiotic and ability to protect broiler chicks against *Salmonella enteritidis* infection.

A. D. Wolfenden*, C. M. Pixley, J. P. Higgins, S. E. Higgins, A. Torres Rodriguez, G. Tellez, and B. M. Hargis, University of Arkansas, Fayetteville.
Methods to improve the economics of egg antibody production.
D. L. Trott*, M. Yang¹, P. L. Utterback², K. W. Koelkebeck², and M. E. Cook¹, ¹University of Wisconsin, Madison, ²University of Illinois, Urbana.

Supplementation of the probiotic MitoMax enhances immune responses to coccidiosis in broiler chickens.
S-H. Lee¹, H. Lillehoj*¹, D-W. Park¹, R. Dalloul¹, Y-H Hong¹, E. Lillehoj², and J. Lin³, ¹Animal and Natural Resources Institute, ARS, USDA, Beltsville, Maryland, ²University of Maryland, Baltimore, ³Imagilin Technology, Frederick, Maryland.

Wednesday, July 19
Metabolism and Nutrition

Nutrition A - Protein/Amino Acids and Feeds
Chair: Curtis L. Novak, Virginia Tech
ETLC 1-001

8:00 AM  211
Amino acid requirements in laying hens fed two different energy levels.
M. L. Locatelli*, A. Lemme¹, D. Hoehler¹, P. J. A. Wijtten², J. Van Wichen², J. K. W. M. Sparla², and D. J. Langhout², ¹Degussa Corp., Kennesaw, Georgia, ²Provimi P.Y., Rotterdam, The Netherlands.

8:15 AM  212
Effects of reducing dietary protein on performance of White Leghorn layers during the second production cycle.
H. M. Yakout*, D. Hoehler², and C. Novak¹, ¹Virginia Tech, Blacksburg, ²Degussa Corporation, Kennesaw, Georgia.

8:30 AM  213
Appropriate statistical methods to compare dose responses of methionine sources.
D. D. Kratzer*¹ and R. C. Littell², ¹E-Sci, dba., Olivet, Michigan, ²University of Florida, Gainesville.
Improved colostomy technique and excrement collection device for broilers and broiler breeder hens.
M. K. Manangi*, F. D. Clark, and C. N. Coon, University of Arkansas, Fayetteville.

A critical analysis of methods to determine nutritional requirements.
G. M. Pesti*, University of Georgia, Athens.

Mean separation procedures used in Poultry Science.
J. A. Cason*1 and G. M. Pesti2, 1Russell Research Center, Athens, Georgia, 2University of Georgia, Athens.

Effect of different levels of protein and sulfur amino acids on mature broiler breeder hens performance, carcass and reproductive morphology.
A. Pishnamazi*, J. Purreza1, and F. E. Robinson2, 1Isfahan University of Technology, Isfahan, Isfahan, Iran, 2University of Alberta, Edmonton, AB, Canada.

Maintenance nitrogen requirement of adult female ostriches (Struthio camelus).
D. C. Bennett*, A. Kaneko, and Y. Karasawa, Shinshu University, Minamiminowa-mura, Nagano-ken, Japan.

The amino acid requirements for production and fertility of broiler breeder hens at peak production.
M. de Beer* and C. N. Coon, University of Arkansas, Fayetteville.

Effect of sunn hemp seed inclusion in broiler starter diets on live performance attributes.
J. B. Hess*1, V. A. Drouet1, and J. A. Mosjidis2, 1Auburn University, Auburn, Alabama, 2Auburn University, Auburn, Alabama.

Determination of the metabolisable energy of sweet potato tuber meal and its utilization by growing pullets.
O. Ladokun*, F. Aderemi2, and O. Tewe3, 1Lead City University, Ibadan, Oyo State, Nigeria, 2Bowen University, Iwo, Osun State, Nigeria, 3University Of Ibadan, Ibadan, Oyo State, Nigeria.
Dietary energy needs of broilers from 2.0 to 4.0 kg as influenced by ambient temperature.
W. A. Dozier*, J. L. Purswell1, A. Corzo2, M. T. Kidd2, and S. L. Branton1, 1USDA-ARS Poultry Research Unit, Mississippi State, Mississippi, 2Mississippi State University, Mississippi State.

The effect of different levels of virginiamycin and energy on performance and blood components in broiler chicks.
F. Ahmadi*, Azad University of Sanandaj, Sanandaj, Kurdistan, Iran.

True metabolizable energy in meat and bone meal from Iran.
H. Janmohammadi*, H. Nassiri Moghaddam2, J. Pourreza3, M. Danesh Mesgran2, and A. Golian4, 1University of Tabriz, Tabriz, East Azarbijan, Iran, 2University of Ferdowsi, Mashhad, Iran, 3Esfan University of Technology, Esfahan, Iran, 4University of Manitoba, Winnipeg, MB, Canada.

Metabolism and Nutrition

Nutrition B - Enzymes & Manufacturing
Chair: Joseph S. Moritz, West Virginia University
ETLC 1-017

Variability in feed value of Australian wheat-, triticale- and sorghum-based diets supplemented with and without enzymes for broilers.
T. A. Scott*, University of Sydney, Camden, NSW, Australia.

Should oligosaccharides be considered as antinutritive factors and target substrates for enzyme use in broiler chicken diets?
B. A. Slominski*, X. Meng1, L. D. Campbell1, W. Guenter1, and O. Jones2, 1University of Manitoba, Winnipeg, MB, Canada, 2Canadian Bio-Systems Inc., Calgary, AB, Canada.
Enzyme for corn-soybean meal diet: Target substrates and enzyme efficacy in broiler chickens.
B. A. Slominski*1, X. Meng1, D. Boros1, L. D. Campbell1, W. Guenter1, W. Jia1, and O. Jones2, 1University of Manitoba, Winnipeg, Canada, 2Canadian Bio-Systems Inc., Calgary, Canada.

Improving soybean meal digestion during the full first cycle of lay.
A. E. Sefton*1 and S. Leeson2, 1Alltech, Inc., Guelph, ON, Canada, 2University of Guelph, Guelph, ON, Canada.

The effect of enzymes on degradation of corn DDGS using in vitro assay.
S. Dalsgaard*1 and M. Hruby2, 1Danisco Innovations, Brabrand, Denmark, 2Danisco Animal Nutrition, St. Louis, Missouri.

Effect of formulating of B-Mannanase (Hemicell Feed Enzyme) into turkey tom diets varying in amino acid density.
M. E. Jackson*1, J. Mitchell2, and G. F. Mathis3, 1ChemGen Corp, Gaithersburg, Maryland, 2Akey Inc, Lewisburg, Ohio, 3Southern Poultry Research, Athens, Georgia.

Effect of β-mannanase (Hemicell® feed enzyme) on acute phase protein levels in chickens and turkeys.

Influence of source and particle size of fibrous ingredients on nutrient utilization of broilers at nine days of age.
J. M. González–Alvarado1, E. Jiménez–Moreno2, D. González–Sánchez2, R. Lázaro2, and G. G. Mateos*2, 1Universidad Autónoma de Tlaxcala, Mexico, 2Universidad Politécnica de Madrid, Spain.

The effects of sucrose or electrolyte supplements and corn particle grind size on Ross broilers during stress and during post-stress recovery.
W. S. Virden*, A. C. DeLeon, A. Corzo, and M. T. Kidd, Mississippi State University, Mississippi State.
10:30 AM  234  
**Efficacy of germination time and use of a preservative (potassium di-formate) on feeding value of wheat for broilers.**
C. M. Tomkinson and T. A. Scott*, University of Sydney, Camdne, NSW, Australia.

10:45 AM  235  
**The effect of dietary L-carnitine on production and metabolism of broiler breeder hens reared using everyday or skip-a-day feed restriction programs.**
M. de Beer* and C. N. Coon, University of Arkansas, Fayetteville.

11:00 AM  236  
**Evaluation of limit feeding low-energy diets for a varying number of days in a non-feed withdrawal laying hen molt program.**
P. L. Utterback*, E. J. Kim, C. M. King, K. W. Koelkebeck, and C. M. Parsons, University of Illinois, Urbana.

11:15 AM  237  
**Influence of cereal type, heat processing of the cereal, and inclusion of fiber in the diet on organ weights and ileal digestibility of nutrients in broilers.**

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### Processing, Products, and Food Safety

#### Broiler Microbiology

**Chair: Michael Musgrove, USDA/ARS NREF 2-001**

8:00 AM  238  
**Growth of Campylobacter spp. in media supplemented with organic acids.**
A. Hinton, Jr.*, Russell Research Center, Athens, Georgia.

8:15 AM  239  
**Organic acid water treatment reduced Salmonella horizontal transmission in broiler chickens.**
C. Knight*¹, C. Hofacre², G. Mathis³, M. Quiroz¹, and J. Dibner¹, ¹Novus International, Inc, St. Louis, Missouri, ²Poultry Diagnostic & Research Center, Athens, Georgia, ³Southern Poultry Research, Inc., Athens, Georgia.
8:30 AM 240
Control of caecal Salmonella by dietary FOS in probiotic treated broiler chickens.
J. R. Chambers*1, J. Gong1, B. Sanei2, C. Gyles3, M. A. Hayes3, and S. Sharif3, 1Food Research Program, AAFC, Guelph, ON, Canada, 2Ontario Ministry of Agriculture and Food, Guelph, ON, Canada, 3OVC, University of Guelph, Guelph, ON, Canada.

8:45 AM 241
Effect of internal versus external fecal contamination on broiler carcass microbiology.

9:00 AM 242
Inhibition of Campylobacter and Salmonella on whole chicken carcasses using a novel intervention technology.
T. W. Thompson*, C. Z. Alvarado, and M. M. Brashears, Texas Tech University, Lubbock.

9:15 AM 243
Recovery of bacteria from broiler carcasses after immersion chilling in different volumes of water, Part 2.
J. K. Northcutt*, J. A. Cason1, K. D. Ingram1, D. P. Smith1, R. J. Buhr1, and A. Hinton, Jr.1, 1USDA-ARS, Athens, Georgia, 2The University of Georgia, Athens.

9:30 AM 244
Coliforms, E. coli, Campylobacter, and Salmonellae in a counterflow broiler scald with a dip tank.
J. A. Cason* and A. Hinton, Jr., Russell Research Center, Athens, Georgia.

9:45 AM 245
Colonization of the reproductive tract and deposition inside eggs laid by hens infected with Salmonella enteritidis or S. heidelberg.

10:00 AM
Break.

Egg Microbiology.

Moderator: J.R. Chambers.
Agriculture & Agri-Food Canada, Guelph, ON, Canada.
Prevalence of *Salmonella*, *Campylobacter* and *Listeria* on the surface of vacuum loaders in shell egg processing plants. D. R. Jones* and M. T. Musgrove, USDA-ARS, Egg Safety and Quality Research Unit, Athens, Georgia.

Enterobacteriaceae and related organisms isolated from shell eggs washed in cooler wash water. M. T. Musgrove* and D. R. Jones, Egg Safety and Quality Research Unit, USDA-ARS, Athens, Georgia.

Microbiological survey of seven types retail shell eggs. M. T. Musgrove* and D. R. Jones, Egg Safety and Quality Research Unit, USDA-ARS, Athens, Georgia.

Albumen quality and functionality from eggs produced by hens from five layer strains over two production cycles. P. A. Curtis*, L. K. Kerth¹, and K. E. Anderson², ¹Auburn University, Auburn, Alabama, ²North Carolina State University, Raleigh.

Functionality and quality of whole eggs and yolk from five different layer strains over two production cycles. L. K. Kerth*, P. A. Curtis¹, and K. E. Anderson², ¹Auburn University, Auburn, Alabama, ²North Carolina State University, Raleigh.
Physiology, Endocrinology, and Reproduction

Reproduction
Chair: R. Jeff Buhr, USDA/ARS
NREF 2-003

8:15 AM 251
Are thermal manipulations to improve thermotolerance during chick’s embryogenesis only a question of fine tuning?
S. Yahav*, Institute of Animal Science ARO the Volcani Center, Bet Dagan, Israel.

8:30 AM 252
Incubator temperature and oxygen concentration affect the physiology of selected muscles of broiler embryos at the plateau stage in oxygen consumption.

8:45 AM 253
Incubator temperature and oxygen concentration affect the growth of selected muscles of broiler embryos at the plateau stage in oxygen consumption.

9:00 AM 254
Determining true fertility of clear eggs identified at 7 days incubation histologically.
K. L. Knight and T. A. Scott*, University of Sydney, Camden, NSW, Australia.

9:15 AM 255
Effect of cooling and developmental age on quail embryo heart rate.
B. C. Wentworth*, University of Wisconsin, Madison.

9:30 AM 256
Torpor in quail embryos and young quail chicks.
B. C. Wentworth*, J. L. Cigan, and T. J. Schaaf, University of Wisconsin, Madison.
Effect of breeder hen age and incubation temperature on embryonic temperature and development of White Pekin ducklings.
K. A. Kroesen* and M. S. Lilburn, The Ohio State University, Wooster.

Defining physiological parameter relationships of the pre- and post-hatch broiler chick including the impacts of sex and time of hatch.

Determination of eggshell microstructural characteristics and associated physiological profiles in MG-vaccinated egg-laying chickens.

Chicken amphiregulin (AR) gene: cDNA cloning, promoter analysis, and regulation of its mRNA expression in the cultured ovarian granulosa cells.
Y. Wang*, J. Li, and F. C. Leung, The University of Hong Kong, Hong Kong, HK-SAR, China.

Cloning of chicken epigen and regulation of its mRNA expression in the cultured ovarian granulosa cells.
Y. Wang*, J. Li, and F. C. Leung, The University of Hong Kong, Hong Kong, HK-SAR, China.

Characterization of fourteen chicken PAC1 receptor spliced variants: Evidence for the conserved 13bp intronic sequence as a critical factor to determine signaling properties and splicing patterns of PAC1 receptor.
Y. Wang*, J. Li, and F. C. Leung, The University of Hong Kong, Hong Kong, HK-SAR, China.
Embryo Symposium

Managing the Embryo for Performance
Chair: Michael J. Wineland and Catherine A. Ricks, North Carolina State University and Embrex, Inc.
ETLC 1-017

1:00 PM 263
Managing incubation: Where are we and why?
R. M. Hulet*, Pennsylvania State University, University Park.

1:15 PM
Egg storage and the embryo.
G. M. Fasenko, University of Alberta, Edmonton, AB, Canada.

1:45 PM 264
Incubation parameters and chick quality.

2:20 PM 265
Attainment of thermoregulation.
B. Tzschentke*, University of Berlin, Humboldt, Germany.

2:55 PM
Break.

3:10 PM 266
The endocrine interface of environmental and egg factors affecting chick quality.
E. Decuypere* and V. Bruggeman, Catholic University, Leuven (Heverlee), Belgium.

3:45 PM 267
Nutrition of the developing embryo and hatchling.
E. Moran*, Auburn University, Auburn, Alabama.

4:20 PM
Muscle development in the embryo and hatchling.
S. G. Velleman, Ohio State University, Columbus.

4:55 PM
Where do we go from here?

81
Metabolic Disease Symposium

Metabolic and Cardiovascular Diseases in Poultry: Nutritional and Physiological Aspects
Chair: Martin Zuidhof, Alberta Agriculture
ETLC 1-013

1:30 PM
Introduction.
M. Zuidhof.

1:40 PM 268
Inadequate pulmonary vascular capacity and susceptibility to pulmonary hypertension syndrome in broilers.
R. F. Wideman*, University of Arkansas, Fayetteville.

2:05 PM 269
Patho-physiology of heart failure in broiler chickens: Structural, biochemical, and molecular characteristics.
A. Olkowski*, University of Saskatchewan, Saskatoon, SK, Canada.

2:30 PM
Exacerbation of metabolic diseases by an inflammatory response.
K. C. Klasing, University of California, Davis.

2:55 PM
Break.

3:10 PM 270
The response of the heart and vasculature to hypoxia, pressure and volume.
R. J. Julian*, University of Guelph, Guelph, ON, Canada.

3:35 PM 271
Metabolic and cardiovascular diseases in poultry: Role of dietary fat.
G. Cherian*, Oregon State University, Corvallis.

3:55 PM
Discussion.
Poultry Welfare Symposium

Realistic Views Concerning Poultry Welfare
Chair: Kenneth W. Koelkebeck and Kenneth E. Anderson, University of Illinois and North Carolina State University
ETLC 1-001

1:30 PM
Welcome and opening remarks.
K. W. Koelkebeck, University of Illinois, Urbana.

1:35 PM 272
Historical perspective on the development of poultry welfare.
A. J. Pescatore*, University of Kentucky, Lexington.

2:05 PM
Public perception of poultry welfare and how it is shaped.
W. Jamison, Agriculture Department, Dordt College Sioux Center, IA.

2:35 PM 273
Animal care guidelines and future directions.
A. B. Webster*, The University of Georgia, Athens.

3:00 PM
Break.

3:15 PM 274
Welfare of poultry in non-cage housing systems.

3:45 PM 275
Molting layers – alternative methods and their effectiveness.
K. W. Koelkebeck* and K. E. Anderson*, University of Illinois, Urbana, North Carolina State University, Raleigh.

4:10 PM
W. Kuenzel, Center of Excellence for Poultry Science, University of Arkansas.

4:35 PM 276
Density allowances for broilers, turkeys and layers: Where to set the limits?
I. Estevez*, University of Maryland, College Park.
POSTER PRESENTATIONS/ WEDNESDAY

Chair: Joseph B. Hess and Kevin M. Downs, Auburn University and Middle Tennessee State University Solarium

Metabolism and Nutrition.

W1 Feeding laying hens low-tanning sorghum does not necessitate extra supplements (methionine, lysine, choline, or sulfur).

W2 Influence of soybean meal sources and total lysine concentration of the diet on performance of broilers.

W3 Inclusion levels of corn distillers grains with solubles and poultry byproduct meal in market turkey diets.
S. L. Noll* and J. Brannon, University of Minnesota, St. Paul.

W4 Apparent metabolizable energy and ileal amino acid digestibility of fababeans, lupins and peas for broiler chickens.

W5 Effects of the level of canola meal, lysine and energy in the rations of broiler chickens.
S. Gomez* and M. L. Angeles, National Center for Disciplinary Research in Animal Physiology, Ajuchitlan, Queretaro, Mexico.

W6 Effect of Betavin® and salinomycin on oocyst production of broilers exposed to either Eimeria acervulina or E. tenella.
J. C. Remus*1 and J. L. McNaughton2, 1Danisco Animal Nutrition, St. Louis, Missouri, 2Solution BioSciences, Inc., Salisbury, Maryland.
Use of Bioplex/Sel-Plex trace minerals in commercial tom turkey diets from 0 to 19 weeks of age.

Impact of wheat middlings, citric acid, and phytase on phosphorus utilization and growth performance of broiler chicks in the starter phase.
T. O’Connor-Dennie* and J. L. Emmert, University of Arkansas, Fayetteville.

Effect of varying concentrations of dietary crude protein and metabolizable energy on laying performance of Pearl Grey guinea fowl hens.
S. N. Nahashon*, N. Adefope, A. Amenyenu, and D. Wright, Institute of Agricultural and Environmental Research, Tennessee State University, Nashville, Tennessee.

Effect of drinking water nitrate on broiler performance.
C. W. Ritz*, A. B. Batal, B. D. Fairchild, and P. Sedlacek, University of Georgia, Athens.

Effect of feeding quinoa on the egg production performance of laying chickens.
N. P. Johnston*, G. Aduviri, A. C. Christensen¹, and A. Parker¹, Brigham Young University, Provo, Utah, University of San Andres, La Paz, Bolivia.

The use of degermed-dehulled corn for rearing turkey toms to market age.
J. L. Godwin and J. L. Grimes*, North Carolina State University, Raleigh.

Relative biological availability of Ca and P in six sources of raw rock phosphates fed to broiler chickens.
G. Diaz*, A. Cuesta², and G. Afanador³, University of Guelph, Guelph, ON, Canada, Universidad de Ciencias Agrarias, Bogota, Cundinamarca, Colombia, Universidad Nacional de Colombia, Bogota, Cundinamarca, Colombia.

The effect of calcium carbonate particle size and solubility on the utilization of phosphorus from phytase for broilers.
M. K. Manangi* and C. N. Coon, University of Arkansas, Fayetteville.
W15 Methionine requirements of alternative slow-growing genotypes.
A. Fanatico*, P. Pillai, T. O’Connor-Dennie, and J. Emmert, University of Arkansas, Fayetteville.

W16 Influence of proteases on the apparent metabolizable energy (AME<sub>n</sub>), ileal and total tract nitrogen digestibility and performance of broilers fed corn-soy diets.
H. Schulze*1, V. Ravindran2, and P. J. Moughan3, 1Danisco Animal Nutrition, Leiden, The Netherlands, 2Institute of Food, Nutrition and Human Health, Palmerston North, New Zealand, 3Riddet Centre, Massey University, Palmerston North, New Zealand.

W17 Investigation of relative bioavailability value and requirement of organic Zn for chicks.

W18 The effect of dietary phytase on digestible energy and growth performance in young chickens.
V. Pirgozliev*1, P. Mares2, T. Acamovic1, and M. R. Bedford3, 1ASRC, Scottish Agricultural College, Edinburgh, Scotland, United Kingdom, 2Mendel University of Agriculture and Forestry, Brno, Czech Republic, 3Syngenta Animal Nutrition Inc., Wiltshire, England, United Kingdom.

W19 Evaluation of an inherent thermo-tolerant phytase in diets of broilers.
E. K. D Nyannor*1, P. Williams2, M. R. Bedford3, and O. Adeola1, 1Purdue University, West Lafayette, 2Syngenta, North Carolina, 3Syngenta Animal Nutrition Inc., Marborough, Wiltshire, United Kingdom.

W20 Effect of plant-based feed alternatives on the growth performance and carcass composition of heavy hen turkeys.
J. L. Maclsaac*1, S. MacPherson2, D. M. Anderson2, and B. Rathgeber3, 1Atlantic Poultry Research Institute, Truro, NS, Canada, 2Nova Scotia Agricultural College, Truro, NS, Canada, 3Agriculture & Agri-Food Canada, Truro, NS, Canada.
W21
Maternal dietary Sel-Plex® (selenium yeast) supplementation increases tissue and plasma glutathione peroxidase activity of broiler chicks.

W22
Dried porcine solubles (DPS) and coccidiosis vaccines on the performance of broilers.
P. H. D. Tomasi and J. L. Andriguetto*, Universidade Federal do Paraná, Curitiba, Paraná, Brazil.

W23
Effects of reduced dietary phytate in phosphorus adequate practical-type diets fed to growing chicks.
M. E. Persia*, R. Angel2, and W. W. Saylor1, 1University of Delaware, Newark, 2University of Maryland, College Park.

Processing, Products, and Food Safety.

W24
Study of effects saccharomyces cerevisiae on performance and biochemical parameters of broiler chicks during aflatoxicosis.
A. Safamehr*1 and M. Shivazad2, 1Maragheh Azad University, Maragheh, Iran, 2Tehran University, Karaj, Iran.

W25
Reduction of Campylobacter jejuni colonization in four week old SPF leghorns using heat-resistant xylanase feed additive.

W26
C. jejuni as a secondary colonizer of poultry biofilms.

W27
Molecular analysis of Salmonella serotypes at different stages of commercial turkey processing.
P. N. Anderson1, M. E. Hume*1,2, J. A. Byrd1,2, S. M. Stevens1, and D. J. Caldwell1, 1Texas A & M University, College Station, 2USDA/ARS, Food and Feed Safety Research Unit, College Station, Texas.
Identification and Serotyping of Escherichia coli strains isolated from poultry carcasses in a public market in Mexico City.
E. Fite1, C. Eslava3, and C. Rosario*2, 1Texas A&M University, College Station, 2Facultad de Medicina Veterinaria y Zootecnia, UNAM, Mexico, D.F. Mexico, 3Facultad de Medicina, Mexico, D.F. Mexico.

The sensory acceptance of table eggs from quinoa-based diets under red and normal lighting.
N. P. Johnston*1, G. Aduviri2, L. Jefferies1, A. Parker1, and B. T. Slaugh3, 1Brigham Young University, Provo, Utah, 2University of San Andres, La Paz, Bolivia, 3Eggland’s Best, King of Prussia, Pennsylvania.

Dietary lipid source and vitamin E effect on lipid oxidation stability of raw chicken parts.
C. Narciso-Gaytán*, C. A. Bailey, A. R. Sams, and M. X. Sánchez-Plata, Texas A&M University, College Station.

Dietary lipid source and vitamin E effect on lipid oxidation stability of cooked chicken patties.
C. Narciso-Gaytán*, C. A. Bailey, A. R. Sams, and M. X. Sánchez-Plata, Texas A&M University, College Station.

Tenderness, juiciness and flavor of pre- and post-rigor marinated broiler breast fillets evaluated by consumer sensory panel.

Conjugated linoleic acid and fish oil in laying hen diets: Effects on egg tocopherols, total fat and fatty acids upon storage.
G. Cherian*1, M. G. Traber2, K. S. Ryu1, M. P. Goeger1, and S. Leonard2, 1Oregon State University, Corvallis, 2Linus Pauling Institute, Oregon State University, Corvallis.
Environment and Management.

W34
Effect of drinking water iron, nitrate, and manganese on broiler performance.
B. D. Fairchild*, A. B. Batal, and C. W. Ritz, University of Georgia, Athens.

W35
Prevalence and antibiotic resistance profile of Campylobacter jejuni from turkey house litter in commercial North Carolina farms.

W36
Impact of poultry litter on surface and groundwater in areas of hydric and non-hydric soil types: stable 15N isotopes of nitrate assessment.

W37
The use of a urease inhibitor on broiler litter.
W. D. King*1, A. J. Pescatore1, A. Singh2, R. S. Gates2, K. D. Casey2, M. J. Ford3, and A. H. Cantor1, 1University of Kentucky, Lexington, 2Department of Biosystems and Agricultural Engineering, Lexington, Kentucky, 3Texas Agricultural Experiment Station, Amarillo.

W38
Mannan oligosaccharides effects on litter bacteria levels.
K. S. Macklin*1, J. P. Blake1, B. A. McCrea2, R. A. Norton1, J. B. Hess1, and S. F. Bilgili1, 1Auburn University, Auburn, Alabama, 2University of California, Davis.

Genetics.

W39
Microarray-based analysis for SNPs associated with high or low humoral immune response in the chicken.
T. Geng* and E. J. Smith, Virginia Polytechnic Institute and State University, Blacksburg.

W40
SLC11A1 and Prosaposin gene polymorphism associations with antibody kinetics in adult chickens.
A. S. Ahmed1,2, J. R. Hasenstein2, and S. J. Lamont*2, 1College of Agriculture, Cairo University, Cairo, Egypt, 2Iowa State University, Ames.
The complete sequence and analysis of the turkey (Meleagris gallopavo) mitochondrial genome.

Genetic analysis of relatedness among commercial and heritage turkeys.

Estimation of repeatability for body weight of Ross broilers in Iran.
H. Naeemipour*, N. Afzali, H. Farhanfar, and A. Riasi, Birjand University, Birjand, Iran.

Correlation coefficients between some traits in commercial hen layers.
A. Riasi* and H. Naeemipour, Birjand University, Birjand, Iran.

Physiology, Endocrinology, and Reproduction.

16S rDNA analysis of the intestinal microbiota in turkey poults in response to antibiotic use.

Vitrification of the inner perivitelline layer of chicken eggs for use in the sperm-egg interaction assay.
D. C. Bongalhardo*1,2, A. S. Flores1, V. Severo1, V. C. Gonzalez1, B. R. Curcio2, M. C. Macedo Jr.2, and J. C. Deschamps2, 1Biology Institute, Federal University, Pelotas, RS, Brazil, 2Biotechnology Center, Federal University of Pelotas, Pelotas, RS, Brazil.

Some observations on molting female Japanese quail.
K. Arora* and V. Vatsalya, Fort Valley State University, Fort Valley, Georgia.
Leptin and its neural effector can modulate long bone growth in the chick.
M. R. Zillhardt¹, A. Undersander², C. S. Carlson², and L. J. Mauro*¹, ¹University of Minnesota, St. Paul, ²University of Minnesota, St. Paul.

Pituitary levels of a putative gonadotropin inhibiting hormone receptor mRNA fluctuate during a reproductive cycle in the chicken.
G. Y. Bedecarrats*, M. Shimizu, and M. Zeini, University of Guelph, Guelph, ON, Canada.

Characterization of structure and tissue distribution of chicken GPR39.
I. Yamamoto*¹, M. Numao², and M. Tanaka²¹, ¹Nippon Veterinary and Life Science University, Musashino, Tokyo, Japan, ²Nippon Veterinary and Life Science University, Musashino, Tokyo, Japan.

Comparison of antimicrobial sensitivity of Escherichia coli strains isolated from broilers in United States of America and Mexico.
C. Rosario*, Universidad Nacional Autónoma de Mexico, Mexico, D.F., Mexico.

Differences among turkey (Meleagris gallopavo) varieties for the incidence and severity of toxin-induced dilated cardiomyopathy.
K. B Gyenai* and E. J. Smith, Virginia Tech, Blacksburg.

Effect of mannanoligosaccharides and enzymes on antibody titers against Newcastle.
M. C. Oliveira*, D. E. Faria Filho², D. F. Figueiredo², R. A. Gravena², R. H. Marques², and V. M. B. Moraes², ¹University of Rio Verde, Rio Verde, GO, Brazil, ²State University of São Paulo, Jaboticabal, SP, Brazil.
Humoral immunity measurements of tom turkeys grown on Sel-Plex/Bio-Plex trace mineral diets.
P. Cotter*1, A. Sefton2, and C. Novak3, 1Framingham State College, Framingham, Massachusetts, 2Alltech-Canada, Inc., Guelph, ON, Canada, 3Virginia Tech, Blacksburg.

Methods in heat-stabilization of gallus domesticus Immunoglobulin Y (IgY).
E. A. Bobeck*, D. L. Trott, M. E. Cook, and M. Yang, University of Wisconsin, Madison.

Influence of pediococcus-based probiotic on coccidiosis in broiler chickens.
S.-H. Lee1, H. Lillehoj*1, D.-W. Park1, R. Dalloul1, Y.-H. Hong1, and J. Lin2, 1Animal and Natural Resources Institute, ARS, USDA, Beltsville, Maryland, 2Imagilin Technology, Frederick, Maryland.
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