

**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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PSA 2006 Schedule At A Glance

Friday, July 14

7:30 AM – 5:00 PM
PSA Board of Directors
Campus Tower

Saturday, July 15

7:30 AM - 5:00 PM
PSA Board of Directors
Campus Tower

3:00 PM – 7:00 PM
Registration Open
ETLC Solarium

Sunday, July 16

7:00 AM – 8:00 PM
Registration Open
ETLC Solarium

7:30 AM – 5:00 PM
Pre-load & Preview
Room
ETLC E1-008

8:00 AM – 5:00 PM
Ancillary Scientists
Symposium
ETLC E1-003

8:00 AM – 4:00 PM
National Extension
Workshop
ETLC E1-007

12:00 PM – 1:00 PM
Ancillary Symposium
Luncheon*
ETLC Solarium

12:00 PM – 1:00 PM
National Extension
Workshop Luncheon*
ETLC Solarium

1:00 PM – 5:00 PM
Informal Nutrition
Symposium
ETLC E1-001

5:00 PM – 6:00 PM
Opening Reception
Meyer Horowitz Foyer

6:00 PM – 7:00 PM
Opening Session
Meyer Horowitz Theater

7:00 PM – 9:00 PM
Ice Cream Social
Dinwoodie Room

Monday, July 17

7:00 AM – 5:00 PM
Registration Open
ETLC Solarium

7:00 AM
Triennial Breakfast*
Lister Hall

7:30 AM – 5:00 PM
Pre-load & Preview
Room
ETLC E1-008

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

8:00 AM – 10:00 AM
ARPAS Exam
Agriculture/Forestry
Centre Rm. 318J

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

8:00 AM – 5:00 PM
Cyber Café
ETLC Solarium

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

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
Hospitality 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.

Welcome to the 95th Annual Meeting of the Poultry Science Association



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 Petite, 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 Ukranian 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 ETLIC Solarium.

Continuing Education

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

On-Site Registration

Registration will be located in the ETLIC 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 ETLIC 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

BRONZE LEVEL
up to - \$1,499

Adisseo USA, Inc.
Agricultural Biotechnology Stewardship
Technical Committee
Alberta Egg Producers
Alberta Hatching Egg Producers
Alberta Turkey Producers
Alltech, Inc.
Alternative Design
Aviagen, Inc.
BASF Corporation
Biomim USA Inc.
Chr. Hansen, Inc.
Colorado Quality Research
Degussa Corporation
Huvepharma, Inc.
Hybrid Turkeys
Katolight Corporation
Midwest Poultry Federation
Nicholas Turkey
RE/MAX GA Committee
Ridley Feed Ingredients, Inc.
Spotted Cow Press

PSA 95th Annual Meeting
Exhibitors

Alternative Design
Biomim 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.

Moderator: R. L. Taylor, Jr., *University of New Hampshire*.

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*.

10:40 AM 3

Genetic mechanisms regulating feed intake, energy balance and body weight in poultry.

M. P. Richards*, *USDA, ARS, ANRI, Growth Biology Laboratory, Beltsville, Maryland.*

11:10 AM 4

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.*

11:40 AM

Lunch.

Session III: Merging QTL scans with gene expression scans (Genome and QTL analysis).

Moderator: K. C. Klasing, *University of California, Davis.*

1:00 PM 5

Analysis of quantitative disease-resistance traits.

S. J. Lamont*, *Iowa State University, Ames.*

1:25 PM

Genomics meets ethology.

L. Anderson, *Swedish University of Agricultural Sciences, Uppsala, Sweden.*

1:55 PM 6

Genetical genomics: Combining gene expression with marker genotypes.

D. De Koning*, C. Cabrera, and C. Haley, *The Roslin Institute, Roslin, United Kingdom.*

2:25 PM

Break.

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

Moderator: R. L. Taylor, *University of New Hampshire.*

2:45 PM 7

Functional annotation of genomic data with metabolic inference.

R. L. Walzem*, *Texas A & M University, College Station.*

3:10 PM 8

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..*

10:55 AM

Federation of Animal Science Societies.

Jerry Baker, *FASS, Savoy, Illinois.*

11:10 AM 10

Professional certification in the animal sciences.

R. Frahm*, *American Registry of Professional Animal Scientists, Savoy, Illinois.*

11:25 AM

Council for Agricultural Science and Technology.

John Bonner, *CAST, Ames, Iowa.*

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.

Mamduh Sifri, *ADM Animal Health & Nutrition, Quincy, Illinois.*

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*¹, O. Elibol², and K. U. Sariyuz², ¹*North Carolina State University, Raleigh*, ²*University of Ankara, Ankara, Turkey*.

8:15 AM 12

Effect of restricted and normal ventilation on broiler hatching egg temperature and embryonic development.

K. E Brannan*, N. Leksrisompong, P. W. Plumstead, J. T. Brake, and H. Romero-Sanchez, *North Carolina State University, Raleigh*.

8:30 AM 13

Genetic strain, egg size, and flock age influences hatchability and broiler performance.

A. M. Franco*, G. M. Fasenko, E. E. O'Dea, and D. R. Korver, *University of Alberta, Edmonton, AB, Canada*.

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*¹, M. Leslie², L. Stevenson², K. Macklin², L. Bauermeister², and J. Hess², ¹*University of California, Davis*, ²*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*¹, M. A. Leslie¹, B. A. McCrea², K. S. Macklin¹, L. J. Bauermeister¹, and J. B. Hess¹, ¹*Auburn University, Auburn, Alabama*, ²*University of California, Davis*.

9:30 AM 17

WITHDRAWN

9:45 AM 18

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.*

10:00 AM

Break.

10:15 AM 19

Dietary modifications to reduce nitrogen consumption and excretion in broilers.

R. Angel*¹, W. Powers², S. Zamzow², and T. Applegate³, ¹*University of Maryland, College Park*, ²*Iowa State University, Ames*, ³*Purdue University, West Lafayette, Indiana.*

10:30 AM 20

Comparison of methods for weighing broilers – manual vs. computerized scales.

K. Budgell*¹, J. MacIsaac², and B. Rathgeber³, ¹*Nova Scotia Agricultural College, Truro, NS. Canada*, ²*Atlantic Poultry Research Institute, Truro, NS. Canada*, ³*Agriculture & Agri-Food Canada, Truro, NS. Canada.*

10:45 AM 21

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

L. F. Romero*¹, R. A. Renema¹, A. Pishnamazi¹, F. E. Robinson¹, and M. J. Zuidhof², ¹*University of Alberta, Edmonton, AB. Canada.*, ²*Alberta Agriculture, Food and Rural Development, Edmonton, AB. Canada.*

11:00 AM 22

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

M. E. Rustad*¹, F. E. Robinson¹, M. J. Zuidhof², and R. A. Renema¹, ¹*University of Alberta, Edmonton, AB, Canada*, ²*Alberta Agriculture, Food and Rural Development, Edmonton, AB, Canada.*

11:15 AM 23

Characterization of relationships among broiler breeder male growth, variability, and mortality.

N. Wolanski*¹, F. Robinson¹, R. Renema¹, and T. Inglis², ¹*University of Alberta, Edmonton, AB, Canada*, ²*Poultry Health Services Ltd., Airdrie, AB, Canada.*

11:30 AM 24

Growth characteristics as a predictor of male quality in broiler breeders.

A. Herron*¹, R. A. Renema¹, F. E. Robinson¹, and J. L. Wilson²,
¹University of Alberta, Edmonton, AB, Canada, ²University of Georgia, Athens.

11:45 AM 25

Comparing the economics of protein and energy levels in full fed molting procedures.

P. L. Ruzler* 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**

8:00 AM 26

Does vitamin U have potential to improve feed efficiency or strengthen the intestinal tract of broilers?

A. L. Shaw*¹, K. S. Macklin¹, J. P. Blake¹, W. V. Narvaez-Solarte², and P. K. Gunawardana¹, ¹Auburn University, Auburn, Alabama, ²Universidad de Caldas, Caldas, Columbia.

8:15 AM 27

Maternal dietary 25-OH vitamin D₃ improves chick early innate immunity.

J. L. Saunders-Blades* and D. R. Korver, University of Alberta, Edmonton, Canada.

8:30 AM 28

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.

8:45 AM 29

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, ¹*University of Alberta, Edmonton, AB, Canada*, ²*Alberta 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*¹, A. N. Kadi¹, and G. W. Barbour², ¹*American University of Beirut, Beirut, Lebanon*, ²*Lebanese 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*¹, M. Quiroz¹, W. Williams², and J. Dibner¹, ¹*Novus International, Inc, St. Louis, Missouri*, ²*Akey, Lewisburg, Ohio*.

10:45 AM 36

Growth and mineralization of the femur of the male turkey.

T. J. Applegate*¹, P. Jaynes¹, J. J. Dibner², M. Quiroz², and J. D. Richards², ¹*Purdue University, West Lafayette, Indiana*, ²*Novus International, Inc., St. Charles, Missouri*.

11:00 AM 37

The relationship between growth of commercial toms and linear skeletal development.

M. S. Lilburn*¹, A. Mitchell², and J. Anderson¹, ¹*The Ohio State University, Wooster*, ²*USDA, Beltsville, Maryland*.

11:15 AM 38

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, ¹*North Carolina State University, Raleigh*, ²*Novus International, Inc., St. Charles, Missouri*, ³*Goldsboro Milling Co., Goldsboro, North Carolina*.

11:30 AM 39

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, Isfaha, Isfahan, Iran*.

Metabolism and Nutrition

Nutrition B - Gut Health and Early Nutrition

Chair: Paul H. Patterson, The Pennsylvania State University
ETLC 1-017

8:00 AM 40

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

D. Bohorquez*, R. Plunske, E. Oviedo, and P. Ferket, *North Carolina State University, Raleigh*.

8:15 AM 41

Immune, growth and carcass responses to dietary threonine of broilers raised in different litter conditions.

A. Corzo*¹, M. T. Kidd¹, G. T. Pharr¹, W. A. Dozier III², and E. A. Koutsos³, ¹*Mississippi State University, Mississippi State*, ²*USDA-ARS Poultry Research Unit, Mississippi State, Mississippi*, ³*California Polytechnic State University, San Luis Obispo*.

8:30 AM 42

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, ¹*North Carolina State University, Raleigh*, ²*University of Illinois, Urbana*.

8:45 AM 43

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

R. D. Kirschenman*, M. Sung, J. Hottman, J. Gallegos, J. L. Saunders-Blades, and D. R. Korver, *University of Alberta, Edmonton, AB, Canada*.

9:00 AM 44

Effect of PrimaLac[®], 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. McBride³, R. Qiu¹, and L. R. Daniel¹, ¹*North Carolina State University, Raleigh*, ²*University of Georgia, Athens*, ³*University of Guelph, Guelph, ON, Canada*.

9:15 AM 45

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

D. M. Hooge*¹, M. Kato², M. Hayashi², H. Miyazaki², and K. Maruta², ¹*Hooge Consulting Service, Inc., Eagle Mountain, Utah*, ²*Calpis Company, Ltd, Tokyo, Japan*.

9:30 AM 46

Effect of Bio-Mos in replacement pullets and layers.

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

9:45 AM 47

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

M. Haj Ayed¹, A. Bessadok*², and M. A. Jarraya¹, ¹*Ecole Supérieure d'Horticulture et de l'évage, Chott Mariem, Sousse, Tunisia*, ²*Société Tunisienne d'Aviculture, Borj Cédria, Rades, Tunisia*.

10:00 AM

Break.

10:15 AM 48

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.*

10:30 AM 49

Assessing liver energy metabolism of late term turkey embryos using microarrays.

J. de Oliveira*¹, P. Ferket¹, C. Ashwell¹, and Z. Uni², ¹*North Carolina State University, Raleigh,* ²*Hebrew University of Jerusalem, Rehovot, Israel.*

10:45 AM 50

Lipid yolk utilization of late term broiler embryos.

Z. Uni* and N. Argov, *Faculty of Agriculture Hebrew University, Rehovot, Israel.*

11:00 AM 51

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, ¹*Mississippi State University, Mississippi State,* ²*Tyson Foods, Incorporated, Forest, Mississippi.*

11:15 AM 52

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. Conner¹, and S. R. Mckee¹, ¹*Auburn University, Auburn, Alabama,* ²*North Carolina State University, Raleigh.*

11:30 AM 53

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 Azarjijan, Iran.*

11:45 AM 54

A new natural feed additive for broiler chickens.

F. Saleh*¹, M. Yamamoto¹, M. Tahir², A. Ohtsuka², and K. Hayashi², ¹*Biogenkoji Research Institute, Kirishima city, Mizobe, Japan,* ²*Kagoshima 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 A₂ (aPLA₂) on preventing coccidia induced growth depression.

M. Schwartz*, M. Yang, and M. Cook, *University of Wisconsin, Madison.*

9:30 AM 61

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. Donoghue², G. Tellez¹, W. G. Bottje¹, and B. M. Hargis¹,
¹University of Arkansas, Fayetteville, ²PP&PSRU, ARS, USDA, Fayetteville, Arkansas.

9:45 AM 62

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

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

10:00 AM

Break.

10:15 AM 63

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

R. Porter*^{1,3}, E. Gingerich², K. Toohey-Kurth^{1,3}, 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.

10:30 AM 64

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

P. S. Holt*, L. E. Vaughn, R. W. Moore, and R. K. Gast, *USDA/ARS Egg Safety & Quality Research Unit, Athens, Georgia.*

10:45 AM 65

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.

11:00 AM 66

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 gallisepticum* inoculations during lay.

K. A. Viscione*¹, E. D. Peebles¹, S. L. Branton², A. M. Vance², S. K. Whitmarsh¹, R. W. Keirs¹, and P. D. Gerard¹, ¹Mississippi State University, Mississippi State, ²USDA, ARS, Poultry Research Unit, Mississippi State, Mississippi.

11:15 AM 67

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

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

11:30 AM 68

Automatic counting with differential and selective media.

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

Physiology, Endocrinology, and Reproduction

Endocrinology

**Chair: James R. Millam, University of
California
NREF 2-003**

8:00 AM 69

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

M. E. Chapman* and R. F. Wideman, *University of Arkansas, Fayetteville.*

8:15 AM 70

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

M. E. Chapman* and R. F. Wideman, *University of Arkansas, Fayetteville.*

8:30 AM 71

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

S. Maddineni*, O. M. Ocón-Grove, S. M. Krzysik-walker, G. L. Hendricks III, and R. Ramachandran, *The Pennsylvania State University, University Park.*

8:45 AM 72

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

S. Maddineni, S. M. Krzysik-Walker, O. M. Ocón-Grove, S. M. Motch, G. L. Hendricks III, and R. Ramachandran*, *The Pennsylvania State University, University Park.*

9:00 AM 73

Expression of 5-HT1A and 5-HT2C receptors in the hypothalamus during the turkey reproductive cycle: Colocalization with tyrosine hydroxylase.

T. Bakken*¹, S. W. Kang¹, A. Thayananuphat¹, J. A. Proudman², and M. E. El Halawani¹, ¹*University of Minnesota, St. Paul,* ²*USDA, Beltsville, Maryland.*

9:15 AM 74

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.*

9:30 AM 75

Dopamine and gonadotrophin releasing hormone-I neuronal activation following photostimulation in the turkey.

A. Thayananuphat*¹, S. W. Kang¹, T. Bakken¹, J. R. Millam², and M. E. El Halawani¹, ¹*University of Minnesota, St Paul,* ²*University of California, Davis.*

9:45 AM 76

Deiodinase II and the immediate early gene product c-fos in the hypothalamus of photostimulated turkey hens.

J. R. Millam*¹, E. K. Hoye¹, and T. D. Siopes², ¹*University of California, Davis,* ²*North Carolina State University, Raleigh.*

10:00 AM

Break.

10:15 AM 77

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.*

10:30 AM 78

Soy phytoestrogen effects on progesterone receptor, ovalbumin synthesis, and vitellogenin production in female broiler chicks.

L. M. Stevenson*, S. H. Oates, A. L. Doernte, J. B. Hess, and W. D. Berry, *Auburn University, Auburn, Alabama.*

10:45 AM 79

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, ¹*University of Arkansas, Fayetteville*, ²*USDA/ARS/BGPL, Beltsville, Maryland.*

11:00 AM 80

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, ¹*Suranaree University of Technology, Thailand*, ²*University of Minnesota, St. Paul*, ³*Kasetsart University, Thailand.*

11:15 AM 81

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. Chaiseha*¹, ¹*Suranaree University of Technology, Thailand*, ²*University of Minnesota, St. Paul*, ³*University of California, Davis.*

11:30 AM 82

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, ¹*Suranaree University of Technology, Thailand*, ²*University of Minnesota, St. Paul*, ³*Kasetsart University, Thailand.*

Extension and Instruction
Chair: Brigid A. McCrea, University of
California
NREF 1-001

1:15 PM 83

Holistic vs. traditional teaching of complex aspects of avian physiology in a laboratory setting.

S. Burgos*, *North Carolina State University, Raleigh.*

1:30 PM 84

Monitoring the health status of California game fowl flocks.

B. A. McCrea* and F. A. Bradley, *University of California, Davis.*

1:45 PM 85

Mississippi poultry nutrient management educational programming.

J. Oldham and T. Chamblee*, *Mississippi State University, Mississippi State.*

2:00 PM 86

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, ¹*University of Kentucky, Lexington,* ²*Kentucky Poultry Federation/ Kentucky Egg Council, Lexington, Kentucky,* ³*Texas Agricultural Experiment Station, Texas A&M University, Amarillo,* ⁴*Department of Biosystems and Agricultural Engineering, Lexington, Kentucky.*

2:15 PM 87

The Egg and I: A training program and resource book for teachers and agents.

A. J. Pescatore*¹ and M. G. Miller², ¹*University of Kentucky, Lexington,* ²*Kentucky Poultry Federation/ Kentucky Egg Council, Lexington, Kentucky.*

Immunology

Chair: **Mark E. Cook, University of Wisconsin
NREF 1-003**

1:15 PM 88

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, ¹*University of New Hampshire, Durham*, ²*Northern Illinois University, DeKalb*.

1:30 PM 89

Identification and characterization of thymosin β 4 in chicken macrophages.

L. Kannan*^{1,2}, R. Liyanage¹, J. Lay¹, and N. Rath², ¹*University of Arkansas, Fayetteville*, ²*USDA-ARS, Poultry Production and Product Safety Research Unit, Fayetteville, Arkansas*.

1:45 PM 90

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

O. T. Bowen*, G. F. Erf, M. E. Chapman, and R. F. Wideman Jr., *University of Arkansas, Fayetteville*.

2:00 PM 91

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

K. R. Hamal*, R. F. Wideman, Jr., B. L. Plumlee, and G. F. Erf, *University of Arkansas, Fayetteville*.

2:15 PM 92

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

S. E. Higgins*, J. P. Higgins, G. F. Erf, A. D. Wolfenden, S. N. Henderson, G. Tellez, and B. M. Hargis, *University of Arkansas, Fayetteville*.

2:30 PM 93

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*.

2:45 PM 94

A novel formula for predicting infectious bursal disease vaccination time based on chick weight rather than age.

A. Vaziry*¹, D. Venne², D. Frenette¹, and A. Silim¹, ¹*Faculté de Médecine Vétérinaire, Université de Montreal, St. Hyacinthe, QB, Canada*, ²*Couvoir Scott, Scott Jonction, QB, Canada*.

3:00 PM 95

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, ¹*Texas A&M University, College Station*, ²*Schering-Plough Animal Health, Union, New Jersey*.

3:15 PM 96

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. Ricke², D. J. Nisbet¹, and M. H. Kogut¹, ¹*USDA-ARS-SPARC, Food & Feed Safety Research Unit, College Station, Texas*, ²*University of Arkansas, Fayetteville*.

3:30 PM 97

Selenium source affects the properties of the anti-Gal natural antibody system in laying hens.

P. Cotter*¹, A. Pescatore³, A. Cantor³, M. Ford³, T. Ao², and J. Pierce², ¹*Framingham State College, Framingham, Massachusetts*, ²*Alltech, Inc., Nicholasville, Kentucky*, ³*University of Kentucky, Lexington*.

3:45 PM 98

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.

P. Biggs*, P. Utterback, E. Kim, C. King, R. Dilger, C. Scherer, and C. Parsons, *University of Illinois, Urbana.*

2:30 PM 104

Increasing the number of phases fed to broiler chickens by blending diets.

R. Currie*¹, J. MacIsaac², and B. Rathgeber³, ¹*Nova Scotia Agricultural College, Truro, NS, Canada,* ²*Atlantic Poultry Research Institute, Truro, NS, Canada,* ³*Agriculture & 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.

M. A. Daniel* and D. M. Anderson, *Nova Scotia Agricultural College, Truro, NS, Canada.*

3:15 PM 107

Corn hybrid kernel trait variation affects broiler chicken growth performance.

S. Moore*¹, D. Beitz¹, K. Stalder¹, C. Stahl¹, W. Fithian², and K. Bregendahl¹, ¹*Iowa State University, Ames*, ²*Golden Harvest Seeds, Inc., Waterloo, Nebraska.*

3:30 PM 108

Corn hybrid kernel trait variation affects laying-hen egg production.

S. Moore*¹, D. Beitz¹, C. Stahl¹, K. Stalder¹, W. Fithian², and K. Bregendahl¹, ¹*Iowa State University, Ames*, ²*Golden 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*¹, E. Jiménez-Moreno², A. González-Serrano², R. Lázaro², and G. G. Mateos², ¹*Universidad Autónoma de Tlaxcala, México*, ²*Universidad Politécnica de Madrid, Spain.*

Physiology, Endocrinology, and Reproduction

Reproduction

Chair: **Yonghong Song, Agriculture Canada
NREF 2-003**

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 glycoalyx.**

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.**

S. M. Krzysik-Walker*, O. M. Ocón-Grove, S. Maddineni, G.
L. Hendricks III, and R. Ramachandran, *The Pennsylvania State
University, University Park.*

2:00 PM 113

**Spontaneously occurring fibroid tumors of the laying
hen oviduct.**

A. L. Doernte*¹, M. G. Conner², M. N. Barnes², S. H. Oates¹,
and W. D. Berry¹, ¹*Auburn University, Auburn, Alabama,* ²*The
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,
¹*Purdue University, West Lafayette, Indiana,* ²*Guidant Corpora-
tion, St. Paul, Minnesota.*

2:30 PM 115

Broiler parent flock age influences embryonic metabolism.

J. A. Hamidu*, G. M. Fasenko, J. J. R. Feddes, E. E. O'Dea, and
C. A. Quellette, *University of Alberta, Edmonton, AB, Canada.*

2:45 PM 116

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, ¹*University of Georgia, Athens*, ²*North Carolina State University, Raleigh*.

3:00 PM 117

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

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

3:15 PM 118

Incubation temperature and eggshell conductance effects on the intestinal maturation and thyroid function in commercial turkey poult 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, ¹*North Carolina State University, Raleigh*, ²*Prestage Farms, Clinton, North Carolina*, ³*USDA-ARS, Beltsville, Maryland*.

3:30 PM 119

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

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

Processing, Products, and Food Safety

Processing and Products

Chair: Bruce Rathgeber, Agriculture &

Agri-Food Canada

NREF 2-001

1:15 PM 120

Modeling broiler growth with Neural Networks using simulated data.

H. A. Ahmad*, T. Habtemariam, B. Tameru, D. Nganwa, L. Ayanwale, and G. Beyene, *Tuskegee University, Tuskegee, Alabama*.

1:30 PM 121

Identifying process variables for a low atmospheric pressure stun/kill system.

J. L. Purswell*¹, J. P. Thaxton², and S. L. Branton¹, ¹USDA-ARS Poultry Research Unit, Mississippi State, Mississippi, ²Mississippi State University, Mississippi State.

1:45 PM 122

Physiology of low atmospheric pressure as a stunning/killing system in broilers.

J. Thaxton*¹, J. Purswell², and S. Branton², ¹Mississippi State University, Mississippi State, ²USDA/ARS Poultry Research Unit, Mississippi State, Mississippi.

2:00 PM 123

Impact of age and time of portioning on tenderness of slittered broiler breast filets.

C. M. Owens*, A. Saha, A. V. S. Perumalla, and J.-F. C. Meullenet, University of Arkansas, Fayetteville.

2:15 PM 124

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

A. Saha*, A. V. S. Perumalla, Y. Lee, J. F. Meullenet, and C. M. Owens, University of Arkansas, Fayetteville.

2:30 PM 125

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

A. V. S. Perumalla*, A. Saha, Y. Lee, J. F. Meullenet, and C. M. Owens, University of Arkansas, Fayetteville.

2:45 PM 126

Evaluation of smoker oven cooking performance using whole broiler carcasses.

L. J. Bauermeister*, M. A. Leslie, E. T. Moran Jr., and S. R. McKee, Auburn University, Auburn, Alabama.

3:00 PM 127

Cathepsin activity in two commercial broiler chicken strains fed supplementary tryptophan.

M. MacKenzie*¹, J. MacIsaac², and B. Rathgeber³, ¹University of Alberta, Edmonton, AB, Canada, ²Atlantic Poultry Research Institute, Truro, NS, Canada, ³Agriculture & Agri-Food Canada, Truro, NS, Canada.

3:15 PM 128

Apple by-products as poultry feed ingredients.

C. Ronalds*¹, H. P. V. Rupasinghe¹, and B. Rathgeber², ¹*Nova Scotia Agricultural College, Truro, NS, Canada*, ²*Agriculture & Agri-Food Canada, Truro, NS, Canada*.

3:30 PM 129

Influence of dietary organic and inorganic chromium supplementation on lipid peroxidation and proteolysis in meat of heat-stressed broiler chicks.

M. Toghyani*¹, M. Shivazad², A. Gheisari³, A. Khodami⁴, and R. Bahadoran¹, ¹*Islamic Azad University, Khorasgan Branch, Esfahan, Iran*, ²*Islamic Azad University, Science and Research Branch, Tehran, Iran*, ³*Esfahan Agricultural Research Center, Esfahan, Iran*, ⁴*Islamic Azad University, Khorasgan Branch, Esfahan, Iran*.

3:45 PM 130

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*¹, A. Knox², and J. McNab², ¹*Danisco Animal Nutrition, Marlborough, Wiltshire, United Kingdom*, ²*Roslin 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.

A. L. Rack*, R. E. Loar, N. P. Buchanan, R. W. Wood, and J. S. Moritz, *West Virginia University, Morgantown.*

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_n 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.*

M11

Fate of Cry3Bb1 protein in laying hens fed diets containing MON 863.

S. E. Scheideler¹, P. Weber*¹, K. Sok¹, R. E. Hileman², and G. F. Hartnell², ¹*University of Nebraska, Lincoln*, ²*Monsanto Company, St. Louis, Missouri*.

M12

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

M. F. F. Fuentes*, R. C. Lima, E. R. Freitas, F. S. Sucupira, R. F. Moreira, and N.M. Braz, *Universidade Federal do Ceará, Fortaleza, Ceará, Brasil*.

M13

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*², ¹*Universidade de Rio Verde, Rio Verde, GO, Brazil*, ²*Universidade Estadual Paulista, Jaboticabal, SP, Brazil*.

M14

The effect of a novel phytase to improve phosphorus utilization of wheat-based diets.

H. Shah*¹, M. M. Harris¹, C. Fodor¹, N. Wall¹, A. Smykot¹, J. Remus², and D. R. Korver¹, ¹*University of Alberta, Edmonton, AB, Canada*, ²*Danisco Animal Nutrition, St. Louis, Missouri*.

M15

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

R. W. Rosebrough*, A. D. Mitchell, B. A. Russell, S. M. Poch, and M. P. Richards, *USDA, Agricultural Research Service, Growth Biology Laboratory, Beltsville, Maryland*.

M16

The effect of different levels of fat and L-carnitine on performance and serum composition of male broiler chicks.

M. Rezaei*¹, A. Attar¹, A. Ghodratnama², and H. Kermanshahi³, ¹*Mazandaran University, Sari, Mazandaran, Iran*, ²*Center of Khorasan Agricultural Researches, Mashhad, Khorasan, Iran*, ³*Ferdowsi University, Mashhad, Khorasan, Iran*.

M17

The effects of phytase supplemented diets on TME, and sialic acid excretion in female turkeys.

V. Pirgozliev*¹, T. Acamovic¹, and M. R. Bedford², ¹*ASRC, Scottish Agricultural College, Edinburgh, Scotland*, ²*Syngenta Animal Nutrition Inc., Marlborough, Wiltshire, England, United Kingdom*.

M18

Effect of pelleting temperature and phytase type on phytase survivability and broiler performance.

R. Angel*¹, N. Ward², and A. D. Mitchell³, ¹*University of Maryland, College Park*, ²*DSM Nutrition Products, Inc., Parsippany, New Jersey*, ³*USDA, 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, ¹*Atatürk University, Erzurum, Turkey*, ²*Atatürk 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, ¹*Virginia Tech, Blacksburg*, ²*Aviagen, 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. Canccherini², E. A. Rodrigues², and V. M. B. Moraes², ¹*University of Rio Verde, Rio Verde, GO, Brazil*, ²*State 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. Espinel³, D. Díaz³, and M. I. Gracia¹, ¹*Imasde Agropecuaria S.L., Madrid, Spain*, ²*Universidad de Murcia, Spain*, ³*Norel 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, ¹*Cobb-Vantress, Siloam Springs, Arkansas*, ²*University of Arkansas, Fayetteville*.

M24

High glucose levels in ovo causes damage to embryos.

A. A. Pedroso*¹, 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.

X. Sun*, C. Troche, A. Parsons, A. McElroy, E. Wong, A. Stevens, and C. Novak, *Virginia Tech, Blacksburg.*

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.

T. A. Woyengo*¹, W. Guenter¹, J. S. Sands², and C. M. Nyachoti¹, ¹*University of Manitoba, Winnipeg, MB, Canada*, ²*Danisco Animal Nutrition, St. Louis, Missouri.*

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*¹, R. Plail¹, M. Mohnl¹, S. Nitsch², and G. Schatzmayr², ¹*University of Natural Resources and Applied Life Sciences, Tulln, Austria*, ²*Biomim 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.

J. M. Regenstein*, *Cornell University, Ithaca, New York.*

M32

Influence of deboning time on meat quality of broilers processed at two market weights.

B. Saenmahayak*, S. F. Bilgili, J. B. Hess, J. Townsend, and M. Nagaraj, *Auburn University, Auburn, Alabama.*

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.

X. Guan*, K. B. Gyenai, F. A. McNabb, and E. J. Smith, *Virginia Tech, Blacksburg.*

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. MacDonald², and T. K. Smith¹, ¹*University of Guelph, Guelph, ON, Canada,* ²*University 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, ¹*University of Guelph, Guelph, ON, Canada,* ²*University 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, ¹*Purdue University, West Lafayette, Indiana,* ²*Cobb-Vantress, Inc., Monticello, Kentucky.*

M38

Properly reporting religious slaughter in the scientific literature.

J. M. Regenstein*, *Cornell University, Ithaca, New York.*

M39

Turkey beak trim and feed form. 1. Effect on turkey performance.

S. L. Noll*¹ and H. Xin², ¹*University of Minnesota, St. Paul,* ²*Iowa 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, ¹*University of Minnesota, St. Paul*, ²*University of Maryland, College Park*, ³*Iowa 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, ¹*Brigham Young University, Provo, Utah*, ²*University 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.

M. Hincke*¹, H. Esmail¹, G. Ansah², and A. Kulenkamp², ¹*University of Ottawa, Ottawa, On, Canada*, ²*Shaver Poultry Breeding Farms Ltd., Cambridge, On, Canada*.

M48

Pedigree and microsatellite marker analyses are comparable methods for estimating inbreeding in an inbred strain of Japanese Quail.

S. H. Kim*¹, K. M. Cheng¹, C. Ritland¹, K. Ritland¹, and F. G. Silversides², ¹*University of British Columbia, Vancouver, BC, Canada*, ²*Agriculture and Agri-food Canada, Agassiz, BC, Canada*.

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*¹, M. S. Byerly¹, J. Simon², L. A. Cogburn³, E. Le Bihan-Duval², and T.E. Porter¹, ¹*University of Maryland, College Park*, ²*INRA, Nouzilly, France*, ³*University 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*¹, N. Kansaku², and U. Kuhnlein¹, ¹*McGill University, Montreal. QC, Canada*, ²*Azabu University, Fuchinobe, Sagamihara, Japan*.

M52

Antimicrobial activity of the anseriform outer eggshell.

O. W. Labadie*¹, J. Picman¹, and M. T. Hincke², ¹*University of Ottawa, Ottawa, ON, Canada*, ²*University 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. Hincke*³, ¹*Station de Recherche Avicoles, INRA, Nouzilly, France*, ²*McGill University, Montreal, QC, Canada*, ³*University of Ottawa, Ottawa, ON, Canada*.

Pathology.

M54

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

F. Lago*, S. Gebert, and T. Rehberger, *Agtech Products, Inc., Waukesha, Wisconsin*.

M55

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

C. Rosario*¹ and C. Eslava², ¹*Universidad Nacional Autonoma de Mexico, Mexico*, ²*Universidad Nacional Autonoma de Mexico, Mexico*.

Tuesday, July 18

Environment and Management

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*¹, A. J. Pescatore¹, A. Singh², R. S. Gates², K. D. Casey³, M. J. Ford¹, and A. H. Cantor¹, ¹*University of Kentucky, Lexington*, ²*University of Kentucky, Lexington*, ³*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*¹, J. Harter-Dennis¹, J. Timmons¹, and J. Meisinger²,
¹*University of Maryland Eastern Shore, Princess Anne*, ²*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*¹, R. Angel², S. Zamzow¹, and T. Applegate³, ¹*Iowa State University, Ames*, ²*University of Maryland, College Parks*, ³*Purdue University, West Lafayette.*

9:15 AM 136

Percent carbon and C:N of broiler litter and cake over consecutive flocks.

C. D. Coufal*¹, A. D. Collins², and J. B. Carey², ¹*Mississippi State University, Starkville*, ²*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, ¹*Alltech Canada, Guelph, ON, Canada*, ²*University 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, ¹*University of Delaware, Newark*, ²*DuPont 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

Influence of lighting program, strain, and temperature on broiler live performance and parts yield.

L. B. Hooie*, R. J. Lien, and J. B. Hess, *Auburn University, Auburn, Alabama*.

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. Clasen, 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*.

Metabolism and Nutrition

Nutrition A - Protein and Amino Acids

Chair: Jason L. Emmert,

University of Arkansas

ETLC 1-001

8:00 AM 144

Effects of a reduction of dietary crude protein on performance and economics in commercial Ross 308 broilers.

E. A. Guaiume*¹, J. Firman¹, D. Hoehler², P. B. Tillman³, D. Burnham⁴, and J. Parcell¹, ¹*University of Missouri, Columbia*, ²*Degussa Corporation, Kennesaw, Georgia*, ³*Ajinomoto Heartland LLC, Chicago, Illinois*, ⁴*Aviagen Inc., Huntsville, Alabama*.

8:15 AM 145

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

D. Hoehler*¹, A. Lemme¹, C. Fisher², and C. Kemp², ¹*Degussa Corporation, Kennesaw, Georgia*, ²*Aviagen Ltd., Edinburgh, Scotland*.

8:30 AM 146

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

R. B. Shirley*¹, D. S. Parker¹, M. Vazquez-Anon¹, C. D. Knight¹, and A. G. Marangos², ¹*Novus International, Inc., St Louis, Missouri*, ²*Nutrition Solutions, Winchester, United Kingdom*.

8:45 AM 147

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

R. A. Coleman*^{1,2}, R. D. Kirschenman¹, S. Moehn¹, and D. R. Korver¹, ¹*University of Alberta, Edmonton, AB, Canada*, ²*University of Queensland, Gatton, Queensland, Australia*.

9:00 AM 148

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

S. A. Adedokun*¹, C. Parsons², M. Lilburn³, O. Adeola¹, and T. J. Applegate¹, ¹*Purdue University, West Lafayette, Indiana*, ²*University of Illinois, Urbana*, ³*The Ohio State University, Columbus*.

9:15 AM 149

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, ¹*Purdue University, West Lafayette, Indiana*, ²*University of Illinois, Urbana*, ³*The Ohio State University, Columbus*.

9:30 AM 150

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

A. R. Olmos, S. L. Vieira^{*}, J. Berres, J. L. B. Coneglian, and D. M. Freitas, *Universidade Federal do Rio Grande do Sul, Porto Alegre, RS, Brazil*.

9:45 AM 151

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

J. L. B. Coneglian, S. L. Vieira^{*}, J. Berres, T. C. K. Bortolini, and G. X. Silva, *Universidade Federal do Rio Grande do Sul, Porto Alegre, RS, Brazil*.

10:00 AM

Break.

10:15 AM 152

Changes in tissue accretion during the acute phase response.

P. Sirimongkolkasem^{*} and K. C. Klasing, *University of California, Davis*.

10:30 AM 153

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*.

10:45 AM 154

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, ¹*Virginia Tech, Blacksburg*, ²*Aviagen, Huntsville, Alabama*.

11:00 AM 155

Intestinal *Clostridium perfringens* and lactobacilli populations in broiler chickens fed protected glycine and proline based diets.

J. P. Dahiya*¹, D. Hoehler², A. G. Van Kessel¹, and M. D. Drew¹,
¹*University of Saskatchewan, Saskatoon SK, Canada*, ²*Degussa Corporation, Kennesaw, Georgia*.

11:15 AM 156

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

T. E. Warren*¹, D. C. Wilkie¹, J. P. Dahiya¹, A. G. Van Kessel¹, D. Hoehler², and M. D. Drew¹, ¹*University of Saskatchewan, Saskatoon, SK. Canada*, ²*Degussa Corporation, Kennesaw, Georgia*.

11:30 AM 157

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

M. de Beer*¹, C. N. Coon¹, R. W. Rosebrough², B. A. Russel², S. M. Poch², and M. P. Richards², ¹*University of Arkansas, Fayetteville*, ²*USDA-ARS, Beltsville, Maryland*.

Metabolism and Nutrition

Nutrition B - Enzymes

**Chair: Janet Remus, Danisco Animal Nutrition
ETLC 1-017**

8:00 AM 158

Effect of phytase and day length on the extent and location of phytate degradation.

M. A. Leslie*¹, M. R. Bedford², and E. T. Moran¹, ¹*Auburn University, Auburn, Alabama*, ²*Syngenta Animal Nutrition, Chestnut House, Beckhampton, United Kingdom*.

8:15 AM 159

Dietary phytate and phytase effects on laying hen performance, nutrient digestibility, mucin and VFA concentration.

M. E. Persia*¹, E. Onyango², P. Jaynes², T. Parr³, and T. J. Applegate², ¹*University of Delaware, Newark*, ²*Purdue University, West Lafayette, Indiana*, ³*Syngenta Animal Nutrition, Research Triangle Park, North Carolina*.

8:30 AM 160

Manipulation of dietary calcium, phosphorus, and phytase in broilers. 1. Effects on performance.

P. W. Plumstead*¹, A. B. Leytem^{2,1}, R. O. Maguire¹, E. Oviedo¹, and J. T. Brake¹, ¹*North Carolina State University, Raleigh*,
²*USDA-ARS, Kimberly, Idaho*.

8:45 AM 161

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*.

9:00 AM 162

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*.

9:15 AM 163

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

M. R. Bedford*, C. L. Wyatt, and T. Parr, *Syngenta Animal Nutrition, RTP, North Carolina*.

9:30 AM 164

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

T. Parr* and C. Wyatt, *Syngenta Animal Nutrition, Research Triangle Park, North Carolina*.

9:45 AM 165

Dietary phytase activities and the efficiency of energy utilisation in chickens.

V. Pirgozliev*¹, P. Mares², T. Acamovic¹, and M. R. Bedford³,
¹*ASRC, Scottish Agricultural College, Edinburgh, Scotland, United Kingdom*,
²*Mendel University of Agriculture and Forestry, Brno, Czech Republic*,
³*Syngenta Animal Nutrition Inc., Marlborough, Wiltshire, England, United Kingdom*.

10:00 AM

Break.

10:15 AM 166

Broiler performance on phytase-supplemented defatted rice bran diet during heat stress.

M. O. Smith*¹ and O. Puminn², ¹*The University of Tennessee, Knoxville*, ²*Kasetsart 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, ¹*North Carolina State University, Raleigh*, ²*USDA-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, ¹*Purdue University, West Lafayette, Indiana*, ²*Danisco 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, ¹*University of Manitoba, Winnipeg, MB, Canada*, ²*Maple Leaf Animal Nutrition, Winnipeg, MB, Canada*, ³*Canadian Biosystems 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. Carvalho¹, J. A. G. Brito¹, and G. O. Figueiredo¹, ¹*UFL, Lavras, MG, Brazil*, ²*UFRGS, 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*¹ and T. D. Siopes², ¹USDA-ARS, Beltsville, Maryland, ²University 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*¹, Y. Obara², J. A. Proudman³, and W. J. Kuenzel¹, ¹University of Arkansas, Fayetteville, ²Meijo University, Nagoya, Japan, ³USDA/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*¹, N. Mobarkey¹, and M. E. El Halawani², ¹Hebrew University of Jerusalem, Rehovot, Israel, ²University 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. Duclos³, J. Simon³, T. E. Porter⁴, and L. A. Cogburn¹, ¹*University of Delaware, Newark*, ²*Michigan State University, East Lansing*, ³*Station de Recherche Avicoles, INRA, Nouzilly, France*, ⁴*University 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, ¹*West Virginia University, Morgantown*, ²*West 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*¹, W. R. Cox², and F. G. Silversides¹, ¹*Agriculture and Agri-Food Canada, Agassiz, BC, Canada*, ²*Canadian Animal Health Management Services Ltd., Chilliwack, BC, Canada*.

11:15 AM 184

Increased internal radiodensity of humeri in high-producing non-commercial laying hens.

W. D. Clark*¹, W. R. Cox², and F. G. Silversides¹, 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.

8:00 AM 185

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*.

8:15 AM 186

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*.

8:30 AM 187

Effect of alkaline scald conditions on *Salmonella* or *Campylobacter* recovery during commercial turkey processing.

S. M. Stevens*¹, J. A. Byrd², A. P. McElroy³, S. M. Anderson¹, D. J. Nisbet², and D. J. Caldwell¹, ¹*Texas A&M University, College Station*, ²*USDA-ARS-SPARC, College Station, Texas*, ³*Virginia Tech, Blackburg*.

8:45 AM 188

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. Fletcher¹, and J. K. Northcutt², ¹*The University of Georgia, Athens*, ²*USDA-ARS, Athens, Georgia*.

9:00 AM 189

Reduction of *Campylobacter* spp on poultry carcasses using various interventions under simulated industry conditions.

T. W. Thompson*, J. R. Blanton, J. E. Mann, M. M. Brashears, and C. Z. Alvarado, *Texas Tech University, Lubbock*.

9:15 AM 190

EU promoted research towards zotechnical feed additives for the safe use in poultry production.

V. Klose*¹, R. Plail¹, M. Mohnl², S. Nitsch², and G. Schatzmayr², ¹*University of Natural Resources and Applied Life Sciences, Tulln, Austria*, ²*Biomin GmbH, Herzogenburg, Austria*.

9:30 AM 191

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

H. Karami¹, W. Cho², M. Song², and H. Sunwoo*¹, ¹*University of Alberta, Edmonton, AB, Canada*, ²*CJ Co., Seoul, Republic of Korea*.

9:45 AM 192

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*.

10:00 AM

Break.

Egg Products.

Moderator: S.M. Russell.

University of Georgia, Athens.

10:15 AM 193

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*.

10:30 AM 194

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, ¹*Auburn University, Auburn, Alabama*, ²*USDA Russell Research Center, Athens, Georgia*, ³*North Carolina State University, Raleigh*.

10:45 AM 195

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-McCluseky*¹, P. A. Curtis¹, K. E. Anderson², L. K. Kerth¹, and O. A. Oyarzabal¹, ¹*Auburn University, Auburn, Alabama*, ²*North Carolina State University, Raleigh*.

11:00 AM 196

Impact of white and brown-egg layer strains and molt on size distribution, and egg quality during the second production cycle.

K. E. Anderson*¹, L. K. Kerth², V. Kretzschmar-McCluskey², and P. A. Curtis², ¹*North Carolina State University, Raleigh*, ²*Auburn University, Auburn, Alabama*.

11:15 AM 197

Feeding White Leghorn hens yeast beta-glucans to influence egg quality.

N. McKillop*¹, J. MacIsaac², and B. Rathgeber³, ¹*Nova Scotia Agricultural College, Truro, NS, Canada*, ²*Atlantic Poultry Research Institute, Truro, NS, Canada*, ³*Agriculture & Agri-Food Canada, Truro, NS, Canada*.

11:30 AM 198

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

J. C. Butler*, P. A. Curtis, and L. K. Kerth, *Auburn University, Auburn, Alabama*.

11:45 AM 199

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*¹, J. S. Church², and J. J. R. Feddes¹, ¹*University of Alberta, Edmonton, AB, Canada*, ²*Alberta Agriculture, Food and Rural Development, Edmonton, AB, Canada*.

8:45 AM 201

Benefits of environmental complexity for broiler breeders.

E. H. Leone*, I. Estevez, and K. Spahn, *University of Maryland, College Park*.

9:00 AM 202

Development of a high-throughput modified atmosphere chamber for the on-farm euthanasia of spent hens.

J. S. Church*, N. J. Cook, D. B. Haley, and D. Slingerland, *Alberta Agriculture, Food and Rural Development, Edmonton, AB, Canada*.

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*¹, H. L. Classen¹, and B. I. Fancher², ¹*University of Saskatchewan, Saskatoon, SK, Canada*, ²*Aviagen Inc., Huntsville, Alabama*.

9:45 AM 205

Effect of photoperiod on mobility and leg defects in broilers.

K. Schwean-Lardner*¹, H. L. Classen¹, and B. I. Fancher², ¹*University of Saskatchewan, Saskatoon, SK, Canada*, ²*Aviagen 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 207

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,
¹*Purdue University, West Lafayette, Indiana*, ²*USDA, West Lafayette, Indiana*.

10:45 AM 208

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

R. M. Marchant-Forde* and H. W. Cheng, *USDA-ARS, West Lafayette, Indiana*.

11:00 AM 209

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

R. M. Marchant-Forde* and H. W. Cheng, *USDA, West Lafayette, Indiana*.

11:15 AM 210

Infrared beak treatment: Part III, Comparative effects of infrared and 1/2 hot-blade trimming on beak topography and growth.

H. W. Cheng* and R. M. Marchant-Forde, *USDA, West Lafayette, Indiana*.

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.

A. A. Pedroso*, V. T. Barbosa, I. B. Maciel, C. E. Barbosa, and K. L. Martins, *University of Goias, Goiania, Goias, Brazil.*

T2

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

K. Nakagawa*, I. Shinzato, and H. Sato, *Ajinomoto Co., Inc., Tokyo, Japan.*

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.

J. Sánchez*¹, E. Esteve-García², D. Díaz³, J. I. Fernández³, and J. Peinado¹, ¹*Imasde Agropecuaria S.L., Madrid, Spain*, ²*IRTA, Spain*, ³*Norel S.A., Madrid, Spain.*

T5

Evaluation of a mineral chelate for late-cyle laying hens.

J. L. MacIsaac*¹, D. M. Anderson², S. J. Butt², and B. Rathgeber³, ¹*Atlantic Poultry Research Institute, Truro, NS, Canada*, ²*Nova Scotia Agricultural College, Truro, NS, Canada*, ³*Agriculture & Agri-Food Canada, Truro, NS, Canada.*

T6

Effect of oligofructose and inulin on calcium and phosphorus content in tibia bone of growing broiler chickens.

D. Ortega-Alvarez*¹, M. Juárez-Ramírez², J. A. Hernández-Lara³, and F. Pérez-Gil Romo³, ¹*Megafarma S.A. de C.V., México, D.F. México*, ²*Facultad de Medicina Veterinaria y Zootecnia, México, D.F. México*, ³*Instituto Nacional de Ciencias Medicas y Nutrición Salvador Zubirán, México, D.F. México.*

T7

Effect of mannan oligosaccharides and enzymes on antibody titers against Gumboro.

M. C. Oliveira¹, D. F. Figueiredo², D. E. Faria Filho², L. C. Canccherini², R. A. Gravena², and V. M. B. Moraes*², ¹*Universidade de Rio Verde, Rio Verde, GO, Brazil*, ²*Universidade 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*², and T. Ward², ¹*Colorado Quality Research, Wellington, Colorado*, ²*Zinpro 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.

E. Jiménez–Moreno, J. M. González–Alvarado, D. González–Sánchez, R. Lázaro, and G. G. Mateos*, *Universidad Politécnica de Madrid, Spain*.

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, ¹*Danisco Animal Nutrition, Leiden, The Netherlands*, ²*Institute of Food, Nutrition and Human Health, Palmerston North, New Zealand*, ³*Riddet 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, ¹*University of Maryland, College Park*, ²*Syngenta 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.

D. Gonzalez*, K. S. Ryu, M. P. Goeger, and G. Cherian, *Oregon State University, Corvallis*.

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, ¹*Danisco Animal Nutrition, Marlborough, Wiltshire, United Kingdom*, ²*Faculdade de Ciências Agrárias e Veterinárias, 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, ¹*Faculdade de Ciências Agrárias e Veterinárias, UNESP, Jaboticabal, São Paulo, Brazil*, ²*Danisco 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-Gonzalez¹, L. Garcia-Andrade¹, D. Ortega-Alvarez², L. M. Guerrero¹, and G. M. Ruiz-Palacios¹, ¹*National Institute of Medical Science and Nutrition, Mexico City, Mexico*, ²*Megafarma, 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, ¹*DSM Nutritional Products Inc., Parsippany, New Jersey*, ²*DSM 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, ¹*China Agricultural University, Beijing, China*, ²*North 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, ¹*University of Delaware, Newark*, ²*University of Maryland, College Park*.

Processing, Products, and Food Safety.

T26

The effect of feeding quinoa on the Omega-3 PUFA contents of chicken eggs.

N. P. Johnston*¹, G. Aduviri², A. Parker¹, R. Hall¹, B. T. Slaugh³, and R. T. Davidson¹, ¹*Brigham Young University, Provo, Utah*, ²*University of San Andres, La Paz, Bolivia*, ³*Eggland's Best, King of Prussia, Pennsylvania*.

T27

Bleed-out and mechanical carcass washing impact on chiller water color, pH, chlorine level and carcass bacteria.

D. L. Brinson^{1,2}, R. J. Buhr*¹, and J. K. Northcutt¹, ¹*USDA-ARS, Russell Research Center, Athens, Georgia*, ²*The University of Georgia, Athens*.

T28

Nutritional composition of grilled and raw enhanced or non-enhanced chicken breast filets.

J. Kiker*¹, J. Howe², J. Holden², C. Alverado¹, J. Boyce¹, A. Luna¹, and L. Thompson¹, ¹*Texas Tech University, Lubbock*, ²*Beltville Human Nutrition Research Center, Beltville, Maryland*.

T29

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

S. M. Mueller*¹, J. C. Howe², J. M. Holden², C. Z. Alvarado¹, L. M. Boylan¹, A. M. Luna¹, D. B. Wester¹, and L. D. Thompson¹, ¹*Texas Tech University, Lubbock*, ²*Beltville Human Nutrition Research Center, Beltville, Maryland*.

T30

Comparative anti-bacterial activity of egg white protein extracts from domestic chicken, turkey, duck and goose.

O. W. Labadie*¹, J. Picman¹, and M.T. Hincke², ¹*University of Ottawa, Ottawa, ON, Canada*, ²*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.

S. Gebert*, C. Kromm, and T. Rehberger, *Agtech Products, Inc., Waukesha, Wisconsin*.

T32

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. Coleman^{*1}, A. V. Karlyshev², B. W. Wren², J-R. Brisson¹, and C. M. Szymanski¹, ¹*NRC Institute for Biological Sciences, Ottawa, ON, Canada*, ²*The London School of Hygiene and Tropical Medicine, London, United Kingdom*.

T33

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

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

Extension and Instruction.

T34

A survey on the hatchability of broiler and turkey eggs in the United States from 1985 through 2005.

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

Environment and Management.

T35

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*.

T36

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

W. Willis*, O. Iskhuemhen, Z. Liu, and M. Johnson, *North Carolina A&T State University, Greensboro*.

T37

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*.

T38

In house compositng and its effect on foodborne pathogens.

K. S. Macklin*, O. A. Oyarzabal, R. A. Norton, J. B. Hess, and S. F. Bilgili, *Auburn University, Auburn, Alabama*.

T39

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

V. Ruiz¹, D. Ruiz¹, A. G. Gernat*¹, J. L. Grimes², J. G. Murillo¹, M. J. Wineland², K. E. Anderson², and R. Maguire³, ¹*Escuela Agricola Panamericana, Zamorano, Tegucigalpa, Honduras*, ²*North Carolina State University, Raleigh*, ³*North Carolina State University, Raleigh*.

T40

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.

T41

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

S. B. Ghebremicael^{1,2}, J. R. Hasenstein¹, and S. J. Lamont*¹, ¹*Iowa State University, Ames*, ²*Wageningen University, Wageningen, The Netherlands*.

T42

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.

T43

Characterization of Duck Pit-1 cDNA and genomic DNA.

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

T44

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*.

T45

Gastrointestinal maturation is accelerated in turkey poultlets 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 Production Agricultural Research Service, USDA, Fayetteville, Arkansas.

T46

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

M. Kikusato*, K. Kato, A. Ohtsuka, and K. Hayashi, *Kagoshima University, Kagoshima, Japan.*

T47

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

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

T48

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

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

T49

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.*

T50

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. Decuypere³, ¹Universidade Estadual Paulista-UNESP, Dracena, SP-Brazil, ²Universidade Estadual Paulista-UNESP, Jaboticabal, SP-Brazil, ³Lab for Livestock Physiology and Immunology-KUL, Leuven, Belgium.

Pathology.

T51

Characterization of *Clostridium* from broiler farms experiencing recurrent outbreaks of gangrenous dermatitis.

T. Neumann*¹, D. Ritter², S. Dunham¹, J. Skalecki¹, and T. Rehberger¹, ¹*Agtech Products, Inc., Waukesha, Wisconsin*, ²*Mountaire Farms of Delaware, Inc., Millsboro, Delaware*.

T52

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

N. A. Cox¹, R. J. Buhr*¹, M. T. Musgrove², L. J. Richardson¹, and P. J. Fedorka-Cray³, ¹*USDA-ARS-PMSRU-Russell Research Center, Athens, Georgia*, ²*USDA-ARS-ESQRU-Russell Research Center, Athens, Georgia*, ³*USDA-ARS-BEAR-Russell Research Center, Athens, Georgia*.

T53

Real time PCR for the rapid detection of avian reoviruses.

K. Guo*¹, J. Giambrone¹, T. Dormitorio¹, and H. Wu², ¹*Auburn University, Auburn, Alabama*, ²*Alabama State University, Montgomery*.

T54

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

O. A. Fagbohun¹, J. J. Giambrone², T. V. Dormitorio*², W. Hongzhan³, and K. Guo², ¹*Auburn University, Auburn, Alabama*, ²*Auburn University, Auburn, Alabama*, ³*Alabama State University, Montgomery*.

T55

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

J. N. Kim*², G. W. Youm¹, and Y. M. Kwon^{1,2}, ¹*University of Arkansas, Fayetteville*, ²*University of Arkansas, Fayetteville*.

Immunology.

T56

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*.

T57

Methods to improve the economics of egg antibody production.

D. L. Trott*¹, M. Yang¹, P. L. Utterback², K. W. Koelkebeck², and M. E. Cook¹, ¹*University of Wisconsin, Madison*, ²*University of Illinois, Urbana*.

T58

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, ¹*Animal and Natural Resources Institute, ARS, USDA, Beltsville, Maryland*, ²*University of Maryland, Baltimore*, ³*Imagilin 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*¹, A. Lemme¹, D. Hoehler¹, P. J. A. Wijtten², J. Van Wichen², J. K. W. M. Sparla², and D. J. Langhout², ¹*Degussa Corp., Kennesaw, Georgia*, ²*Provimi P.V., 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*¹, D. Hoehler², and C. Novak¹, ¹*Virginia Tech, Blacksburg*, ²*Degussa 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, ¹*E-Sci, dba., Olivet, Michigan*, ²*University of Florida, Gainesville*.

8:45 AM 214

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.*

9:00 AM 215

A critical analysis of methods to determine nutritional requirements.

G. M. Pesti*, *University of Georgia, Athens.*

9:15 AM 216

Mean separation procedures used in *Poultry Science*.

J. A. Cason*¹ and G. M. Pesti², ¹*Russell Research Center, Athens, Georgia,* ²*University of Georgia, Athens.*

9:30 AM 217

Effect of different levels of protein and sulfur amino acids on mature broiler breeder hens performance, carcass and reproductive morphology.

A. Pishnamazi*¹, J. Purreza¹, and F. E. Robinson², ¹*Isfahan University of Technology, Isfaha, Isfahan, Iran,* ²*University of Alberta, Edmonton, AB, Canada.*

9:45 AM 218

Maintenance nitrogen requirement of adult female ostriches (*Struthio camelus*).

D. C. Bennett*, A. Kaneko, and Y. Karasawa, *Shinshu University, Minamiminowa-mura, Nagano-ken, Japan.*

10:00 AM

Break.

10:15 AM 219

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.*

10:30 AM 220

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, ¹*Auburn University, Auburn, Alabama,* ²*Auburn University, Auburn, Alabama.*

10:45 AM 221

Determination of the metabolisable energy of sweet potato tuber meal and its utilization by growing pullets.

O. Ladokun*¹, F. Aderemi², and O. Tewe³, ¹*Lead City University, Ibadan, Oyo State, Nigeria,* ²*Bowen University, Iwo, Osun State, Nigeria,* ³*University Of Ibadan, Ibadan, Oyo State, Nigeria.*

11:00 AM 222

Dietary energy needs of broilers from 2.0 to 4.0 kg as influenced by ambient temperature.

W. A. Dozier*¹, J. L. Purswell¹, A. Corzo², M. T. Kidd², and S. L. Branton¹, ¹*USDA-ARS Poultry Research Unit, Mississippi State, Mississippi*, ²*Mississippi State University, Mississippi State*.

11:15 AM 223

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*.

11:30 AM 224

True metabolizable energy in meat and bone meal from Iran.

H. Janmohammadi*¹, H. Nassiri Moghaddam², J. Pourreza³, M. Danesh Mesgran², and A. Golian⁴, ¹*University of Tabriz, Tabriz, East Azarnijan, Iran*, ²*University of Ferdowsi, Mashhad, Iran*, ³*Esfan University of Technology, Esfahan, Iran*, ⁴*University of Manitoba, Winnipeg, MB, Canada*.

Metabolism and Nutrition

Nutrition B - Enzymes & Manufacturing

Chair: Joseph S. Moritz, West Virginia

University

ETLC 1-017

8:00 AM 225

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*.

8:15 AM 226

Should oligosaccharides be considered as antinutritive factors and target substrates for enzyme use in broiler chicken diets?

B. A. Slominski*¹, X. Meng¹, L. D. Campbell¹, W. Guenter¹, and O. Jones², ¹*University of Manitoba, Winnipeg, MB, Canada*, ²*Canadian Bio-Systems Inc., Calgary, AB, Canada*.

8:30 AM 227

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, ¹*University of Manitoba, Winnipeg, Canada*, ²*Canadian Bio-Systems Inc., Calgary, Canada*.

8:45 AM 228

Improving soybean meal digestion during the full first cycle of lay.

A. E. Sefton*¹ and S. Leeson², ¹*Alltech, Inc., Guelph, ON, Canada*, ²*University of Guelph, Guelph, ON, Canada*.

9:00 AM 229

The effect of enzymes on degradation of corn DDGS using in vitro assay.

S. Dalsgaard*¹ and M. Hruby², ¹*Danisco Innovations, Brabrand, Denmark*, ²*Danisco Animal Nutrition, St. Louis, Missouri*.

9:15 AM 230

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, ¹*ChemGen Corp, Gaithersburg, Maryland*, ²*Akey Inc, Lewisburg, Ohio*, ³*Southern Poultry Research, Athens, Georgia*.

9:30 AM 231

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

D. M. Anderson and H.-Y. Hsiao*, *ChemGen Corp., Gaithersburg, Maryland*.

9:45 AM 232

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, ¹*Universidad Autónoma de Tlaxcala, Mexico*, ²*Universidad Politécnica de Madrid, Spain*.

10:00 AM

Break.

10:15 AM 233

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, Camden, 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.

E. Jiménez–Moreno, J. M. González–Alvarado, A. de Coca, R. Lázaro, and G. G. Mateos*, *Universidad Politécnica de Madrid, Spain.*

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, ¹*Novus International, Inc, St. Louis, Missouri*, ²*Poultry Diagnostic & Research Center, Athens, Georgia*, ³*Southern 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, ¹*Food Research Program, AAFC, Guelph, ON, Canada*, ²*Ontario Ministry of Agriculture and Food, Guelph, ON, Canada*, ³*OVC, University of Guelph, Guelph, ON, Canada*.

8:45 AM 241

Effect of internal versus external fecal contamination on broiler carcass microbiology.

D. P. Smith*, J. K. Northcutt, J. A. Cason, A. Hinton, Jr., R. J. Buhr, and K. D. Ingram, *USDA, ARS, Russell Research Center, Athens, Georgia*.

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*¹, J. A. Cason¹, K. D. Ingram¹, D. P. Smith¹, R. J. Buhr¹, and A. Hinton, Jr.¹, ¹*USDA-ARS, Athens, Georgia*, ²*The University of Georgia, Athens*.

9:30 AM 244

Coliforms, *E. coli*, *Campylobacter*, and *Salmonellae* in a counterflow broiler scalding tank 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*.

R. K. Gast*, R. Guraya, J. Guard-Bouldin, P. S. Holt, and R. W. Moore, *USDA-ARS, Egg Safety and Quality Research Unit, Athens, Georgia*.

10:00 AM

Break.

Egg Microbiology.

Moderator: J.R. Chambers.

Agriculture & Agri-Food Canada, Guelph, ON, Canada.

10:15 AM 246

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.*

10:30 AM 247

***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.*

10:45 AM 248

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.*

11:00 AM 249

Albumen quality and functionality from eggs produced by hens from five layer strains over two production cycles.

P. A. Curtis*¹, L. K. Kerth¹, and K. E. Anderson², ¹*Auburn University, Auburn, Alabama*, ²*North Carolina State University, Raleigh.*

11:15 AM 250

Functionality and quality of whole eggs and yolk from five different layer strains over two production cycles.

L. K. Kerth*¹, P. A. Curtis¹, and K. E. Anderson², ¹*Auburn University, Auburn, Alabama*, ²*North 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.

V. L. Christensen*, D. T. Ort, M. M. Mann, M. J. Wineland, P. E. Mozdziak, S. L. Funderburk, J. L. Grimes, and E. R. Oviedo, *North Carolina State University, Raleigh.*

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.

V. L. Christensen*, M. J. Wineland, E. R. Oviedo, S. L. Funderburk, D. T. Ort, J. L. Grimes, P. E. Mozdziak, and M. M. Mann, *North Carolina State University, Raleigh.*

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.*

9:45 AM 257

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.*

10:00 AM

Break.

10:15 AM 258

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

R. W. Keirs*, E. D. Peebles, L. W. Bennett, S. K. Whitmarsh, K. A. Viscione, and P. D. Gerard, *Mississippi State University, Mississippi State.*

10:30 AM 259

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

S. L. Westmoreland*¹, S. B. May¹, M. I. Gracey¹, D. L. Hawkins¹, E. D. Peebles², S. W. Park², and S. L. Branton³, ¹*The University of Texas, Arlington*, ²*Mississippi State University, Mississippi State*, ³*South Central Poultry Research Laboratory USDA, Mississippi State, Mississippi.*

10:45 AM 260

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.*

11:00 AM 261

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.*

11:15 AM 262

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. Fassenko, *University of Alberta, Edmonton, AB, Canada.*

1:45 PM 264

Incubation parameters and chick quality.

R. Meijerhof*, *Nutreco, Boxmeer, The Netherlands.*

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?

C. Williams, Embrex Inc., *Research Triangle Park, North Carolina.*

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.

R. C. Newberry*, *Center for the Study of Animal Well-being, Washington State University, Pullman.*

3:45 PM 275

Molting layers – alternative methods and their effectiveness.

K. W. Koelkebeck*¹ and K. E. Anderson², ¹*University of Illinois, Urbana,* ²*North Carolina State University, Raleigh.*

4:10 PM

**Neurobiological Basis of Sensory Perception:
Welfare Implications of Beak Trimming in Poultry.**

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).

H. İmik, A. Hayirli*, L. Turgut, E. Laçın, S. Çelebi, F. Koç, and L. Yildiz, *Atatürk University, Erzurum, Turkey.*

W2

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

E. Jiménez–Moreno, A. de Coca, J. M. González–Alvarado, R. Lázaro, and G. G. Mateos*, *Universidad Politécnica de Madrid, Spain.*

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.

V. Ravindran*, C. L. Nalle, and G. Ravindran, *Institute of Food, Nutrition and Human Health, Palmerston North, New Zealand.*

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 Betafin® and salinomycin on oocyst production of broilers exposed to either *Eimeria acervulina* or *E. tenella*.

J. C. Remus*¹ and J. L. McNaughton², ¹*Danisco Animal Nutrition, St. Louis, Missouri,* ²*Solution BioSciences, Inc., Salisbury, Maryland.*

W7

Use of Bioplex/Sel-Plex trace minerals in commercial tom turkey diets from 0 to 19 weeks of age.

C. Novak*¹, L. Lihong¹, A. P. McElroy¹, and A. Sefton², ¹*Virginia Tech, Blacksburg*, ²*Alltech Inc., Nicholasville, Kentucky*.

W8

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*.

W9

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*.

W10

Effect of drinking water nitrate on broiler performance.

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

W11

Effect of feeding quinoa on the egg production performance of laying chickens.

N. P. Johnston*¹, G. Aduviri², A. C. Christensen¹, and A. Parker¹, ¹*Brigham Young University, Provo, Utah*, ²*University of San Andres, La Paz, Bolivia*.

W12

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*.

W13

Relative biological availability of Ca and P in six sources of raw rock phosphates fed to broiler chickens.

G. Diaz*¹, A. Cuesta², and G. Afanador³, ¹*University of Guelph, Guelph, ON, Canada*, ²*Universidad de Ciencias Agrarias, Bogota, Cundinamarca, Colombia*, ³*Universidad Nacional de Colombia, Bogota, Cundinamarca, Colombia*.

W14

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_n), ileal and total tract nitrogen digestibility and performance of broilers fed corn-soy diets.

H. Schulze*¹, V. Ravindran², and P. J. Moughan³, ¹*Danisco Animal Nutrition, Leiden, The Netherlands*, ²*Institute of Food, Nutrition and Human Health, Palmerston North, New Zealand*, ³*Riddet Centre, Massey University, Palmerston North, New Zealand.*

W17

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

T. Ao*, J. L. Pierce, R. Power, K. A. Dawson, A. J. Pescatore, A. H. Cantor, and M. J. Ford, *Alltech-University of Kentucky Nutritional Research Alliance, Lexington.*

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, ¹*ASRC, Scottish Agricultural College, Edinburgh, Scotland, United Kingdom*, ²*Mendel University of Agriculture and Forestry, Brno, Czech Republic*, ³*Syngenta 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, ¹*Purdue University, West Lafayette*, ²*Syngenta, North Carolina*, ³*Syngenta Animal Nutrition Inc., Marlborough, Wiltshire, United Kingdom.*

W20

Effect of plant-based feed alternatives on the growth performance and carcass composition of heavy hen turkeys.

J. L. MacIsaac*¹, S. MacPherson², D. M. Anderson², and B. Rathgeber³, ¹*Atlantic Poultry Research Institute, Truro, NS, Canada*, ²*Nova Scotia Agricultural College, Truro, NS, Canada*, ³*Agriculture & Agri-Food Canada, Truro, NS, Canada.*

W21

Maternal dietary Sel-Plex® (selenium yeast) supplementation increases tissue and plasma glutathione peroxidase activity of broiler chicks.

T. Ao*, A. H. Cantor, R. Power, J. L. Pierce, A. J. Pescatore, and M. J. Ford, *Alltech-University of Kentucky Nutritional Research Alliance, Lexington.*

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*¹, R. Angel², and W. W. Saylor¹, ¹*University of Delaware, Newark,* ²*University 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, ¹*Maragheh Azad University, Maragheh, Iran,* ²*Tehran University, Karaj, Iran.*

W25

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

R. A. Coleman*, R. N. Walton, M. Lamoureux, M. Wood, W. Sung, and C. M. Szymanski, *NRC, Institute for Biological Sciences, Ottawa, ON, Canada.*

W26

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

I. Hanning*, A. O'Leary, and M. Slavik, *University of Arkansas, Fayetteville.*

W27

Molecular analysis of *Salmonella* serotypes at different stages of commercial turkey processing.

P. N. Anderson¹, M. E. Hume*^{1,2}, J. A. Byrd^{1,2}, S. M. Stevens¹, and D. J. Caldwell¹, ¹*Texas A & M University, College Station,* ²*USDA/ARS, Food and Feed Safety Research Unit, College Station, Texas.*

W28

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, ¹*Texas A&M University, College Station*, ²*Facultad de Medicina Veterinaria y Zootecnia, UNAM, Mexico, D.F. Mexico*, ³*Facultad de Medicina, Mexico, D.F. Mexico*.

W29

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. Slauch³, ¹*Brigham Young University, Provo, Utah*, ²*University of San Andres, La Paz, Bolivia*, ³*Eggland's Best, King of Prussia, Pennsylvania*.

W30

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*.

W31

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*.

W32

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

A. Saha*, A. V. S. Perumalla, Y. Lee, J. F. Meullenet, and C. M. Owens, *University of Arkansas, Fayetteville*.

W33

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, ¹*Oregon State University, Corvallis*, ²*Linus Pauling Institute, Oregon State University, Corvallis*.

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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.*

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

W. Willis*, M. Worku, and C. Murray, *North Carolina A&T State University, Greensboro.*

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

C. M. Williams*, W. J. Showers, and G. D. Jennings, *North Carolina State University, Raleigh.*

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The use of a urease inhibitor on broiler litter.

W. D. King*¹, A. J. Pescatore¹, A. Singh², R. S. Gates², K. D. Casey³, M. J. Ford¹, and A. H. Cantor¹, ¹*University of Kentucky, Lexington*, ²*Department of Biosystems and Agricultural Engineering, Lexington, Kentucky*, ³*Texas Agricultural Experiment Station, Amarillo.*

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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, ¹*Auburn University, Auburn, Alabama*, ²*University of California, Davis.*

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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.*

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SLC11A1 and Prosaposin gene polymorphism associations with antibody kinetics in adult chickens.

A. S. Ahmed^{1,2}, J. R. Hasenstein², and S. J. Lamont*², ¹*College of Agriculture, Cairo University, Cairo, Egypt*, ²*Iowa State University, Ames.*

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The complete sequence and analysis of the turkey (*Meleagris gallopavo*) mitochondrial genome.

X Guan*, K. B. Gyenai, and E. J. Smith, *Virginia Tech, Blacksburg.*

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Genetic analysis of relatedness among commercial and heritage turkeys.

D. Kamara*, K. B. Gyenai, K. C. Lin, and E. J. Smith, *Virginia Tech, Blacksburg.*

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Estimation of repeatability for body weight of Ross broilers in Iran.

H. Naeemipour*, N. Afzali, H. Farhanfar, and A. Riasi, *Birjand University, Birjand, Iran.*

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Correlation coefficients between some traits in commercial hen layers.

A. Riasi* and H. Naeemipour, *Birjand University, Birjand, Iran.*

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and Reproduction.**

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

K. Bos*, D. Karunakaran, and T. Rehberger, *Agtech Products, Inc., Waukesha, Wisconsin.*

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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, ¹*Biology Institute, Federal University, Pelotas, RS, Brazil*, ²*Biotechnology Center, Federal University of Pelotas, Pelotas, RS, Brazil.*

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Some observations on molting female Japanese quail.

K. Arora* and V. Vatsalya, *Fort Valley State University, Fort Valley, Georgia.*

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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, ¹*University of Minnesota, St. Paul*, ²*University of Minnesota, St. Paul*.

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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*.

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Characterization of structure and tissue distribution of chicken GPR39.

I. Yamamoto*¹, M. Numao², and M. Tanaka^{2,1}, ¹*Nippon Veterinary and Life Science University, Musashino, Tokyo, Japan*, ²*Nippon Veterinary and Life Science University, Musashino, Tokyo, Japan*.

Pathology.

W51

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*.

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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*.

Immunology.

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Effect of mannanoligosaccharides and enzymes on antibody titers against Newcastle.

M. C. Oliveira*¹, D. E. Faria Filho², D. F. Figueiredo², R. A. Gravena², R. H. Marques², and V. M. B. Moraes², ¹*University of Rio Verde, Rio Verde, GO, Brazil*, ²*State University of São Paulo, Jaboticabal, SP, Brazil*.

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Humoral immunity measurements of tom turkeys grown on Sel-Plex/Bio-Plex trace mineral diets.

P. Cotter*¹, A. Sefton², and C. Novak³, ¹*Framingham State College, Framingham, Massachusetts*, ²*Alltech-Canada, Inc., Guelph, ON, Canada*, ³*Virginia Tech, Blacksburg*.

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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*.

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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, ¹*Animal and Natural Resources Institute, ARS, USDA, Beltsville, Maryland*, ²*Imagilin Technology, Frederick, Maryland*.

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