

Poultry Science Association
97th Annual Meeting

Program



Celebrating PSA's Centennial

July 20–23, 2008
Niagara Falls, Canada

*“Birds of a feather
flock together”*

Poultry Science Association 97th Annual Meeting Program

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PSA 2008

Schedule at a Glance

Friday, July 18

7:30 AM – 5:00 PM

PSA Board of Directors
Executive Boardroom, 5th Floor

Saturday, July 19

7:30 AM – 5:00 PM

PSA Board of Directors
Executive Boardroom, 5th Floor

3:00 PM – 7:00 PM

Registration Open
Fallsview Studio B, 3rd Floor

Sunday, July 20

7:00 AM – 8:00 PM

Registration Open
Fallsview Studio B, 3rd Floor

7:00 AM – 5:00 PM

Cyber Café
Fallsview Studio C, 3rd Floor

7:00 AM – 5:00 PM

Preview Room
Upper Fallsview A, 5th Floor

7:00 AM – 5:00 PM

Pre-Load Room
Upper Fallsview B, 5th Floor

8:00 AM – Noon

Symposium: Current and Future
Prospects for Natural and
Organic Poultry
Strategy I, 5th Floor

8:00 AM – 4:00 PM

Keynote Symposium
Great Room B & C, 3rd Floor

12:00 PM – 1:00 PM

Keynote Symposium Luncheon*
Elizabeth Room, Brock Hotel

12:00 PM

Set up Exhibits
Pre-Function Area

1:00 PM – 5:00 PM

Informal Nutrition Symposium
Strategy 2, 5th Floor

5:00 PM – 6:00 PM

Opening Reception
Pre-Function Area, 3rd Floor

6:00 PM – 7:00 PM

Opening Session
Great Room B & C, 3rd Floor

7:00 PM – 9:00 PM

Ice Cream Social
Great Room B & C, 3rd Floor

Monday, July 21

7:00 AM – 5:00 PM

Registration Open
Fallsview Studio B, 3rd Floor

7:00 AM – 5:00 PM

Cyber Café
Fallsview Studio C, 3rd Floor

7:00 AM – 5:00 PM

Preview Room
Upper Fallsview A, 5th Floor

7:00 AM – 5:00 PM

Pre-Load Room
Upper Fallsview B, 5th Floor

8:00 AM – 5:00 PM

Exhibits
Pre-Function Area, 5th Floor

8:00 AM – 5:00 PM

Poster Sessions
Great Room A, 3rd Floor

8:00 AM – Noon

Metabolism and Nutrition I:
Amino Acids
Strategy 2, 5th Floor

Physiology I

Strategy 5 & 6, 5th Floor

Immunology
Strategy 7, 5th Floor

8:00 AM - Noon
National Extension Workshop
Strategy 3, 5th Floor

7:30 AM – 5:00 PM
Job Resource Center
Location to be announced

8:00 AM – 5:00 PM
Poster Session
Great Room A, 3rd Floor

Noon – 1:00 PM
National Poultry Extension
Workshop Luncheon*
Brock Room, Brock Hotel

Noon – 1:00 PM
ARS Scientist Luncheon*
Elizabeth Room, Brock Hotel

Noon – 1:00 PM
Past President's Luncheon*
Victoria Room, Brock Hotel

Noon – 1:00 PM
Poultry Science and JAPR
Editor's Luncheon*
Location to be announced

1:00 PM – 5:00 PM
Environment and Management I
Strategy I, 5th Floor

Metabolism and Nutrition II:
Feed Ingredients
Strategy 2, 5th Floor

Metabolism and Nutrition III:
Nutrition
Strategy 7, 5th Floor

Physiology II
Strategy 5 & 6, 5th Floor

Processing, Products and
Food Safety
Strategy 3, 5th Floor

6:00 PM BBQ*
Queenston Heights Park
Pavilion #1

8:00 AM – 5:00 PM
Hospitality Lounge
Location to be announced

Tuesday, July 22

6:30 AM – 8:00 AM
Poultry Extension Breakfast
Lobby Boardroom, Brock Hotel

7:00 AM – 4:00 PM
Registration Open
Fallsview Studio B, 3rd Floor

7:00 AM – 4:00 PM
Cyber Café
Fallsview Studio C, 3rd Floor

7:00 AM – 4:00 PM
Preview Room
Upper Fallsview A, 5th Floor

7:00 AM – 4:00 PM
Pre-Load Room
Upper Fallsview B, 5th Floor

7:00 AM – 5:00 PM
Exhibits
Pre-Function Area, 5th Floor

8:00 AM – 5:00 PM
Poster Sessions
Great Room A, 3rd Floor

8:00 AM – Noon
Environment and Management II
Strategy 1, 5th Floor

Extension and Instruction
Strategy 5 & 6, 5th Floor

Metabolism and Nutrition IV:
Vitamins, Minerals and Feed
Manufacturing
Strategy 2, 5th Floor

Pathology
Strategy 7, 5th Floor

8:00 AM - Noon

Symposium: The Future of
Poultry Science
Strategy 5 & 6, 5th Floor

11:00 AM – Noon

WPSA-USA Board Meeting
Executive Boardroom, 5th Floor

Noon – 1:00 PM

WPSA-USA Board Luncheon*
Elizabeth Room, Brock Hotel

Noon – 1:00 PM

APHS Luncheon*
Victoria Room, Brock Hotel

Noon – 1:00 PM

Graduate Student Luncheon*
Brock Room, Brock Hotel

1:00 PM – 2:00 PM

WPSA Lecture
Great Room C, 3rd Floor

2:00 PM – 4:00 PM

PSA Business Meeting
Great Room C, 3rd Floor

4:00 PM – 5:00 PM

Department Heads Meeting
Executive Boardroom, 5th Floor

6:00 PM – 7:00 PM

Landmark Symposium Reception*
Great Room Pre-Function Area,
3rd Floor

7:00 PM – 9:00 PM

Landmark Papers Symposium
Great Room C, 3rd Floor

9:00 PM – 11:30 PM

PSA Hatchery Student Mixer*
Planet Hollywood Adventure
Room

Wednesday, July 23**7:00 AM – 8:00 AM**

Michigan State University
Breakfast*
Elizabeth Room, Brock Hotel

7:30 AM – Noon

Registration Open
Fallsview Studio B, 3rd Floor

7:30 AM – Noon

Cyber Café
Fallsview Studio C, 3rd Floor

7:00 AM – 2:00 PM

Preview Room
Upper Fallsview A, 5th Floor

7:00 AM – 1:00 PM

Pre-Load Room
Upper Fallsview B, 5th Floor

8:00 AM – Noon

Exhibits
Pre-Function Area, 5th Floor

8:00 AM – 10:30 AM

FASS Workshop on Ag Guide
Revision
Strategy I, 5th Floor

8:00 AM – Noon

Behavior and Well-Being
Strategy 5 & 6, 5th Floor

Environment and Management III

Strategy 3, 5th Floor

Metabolism and Nutrition V:

Enzymes
Strategy 2, 5th Floor

Noon – 1:00 PM

National Poultry Waste
Management Luncheon*
Elizabeth Room, Brock Hotel

1:00 PM – 5:00 PM

Symposium: Use of Multimedia
Educational Tools in Poultry
and Egg Processing Initiatives for
Teaching, Extension and Outreach
Strategy 1, 5th Floor

1:00 PM – 5:00 PM

Genetics

Strategy 7, 5th Floor

Metabolism and Nutrition VI:

Feed Additives

Strategy 2, 5th Floor

1:00 PM – 5:00 PM

Symposium: PSE Syndrome
in Poultry

Strategy 3, 5th Floor

4:30 PM – 6:00 PM

Texas A&M University Social*

Brock Room, Brock Hotel

6:00 PM – 7:00 PM

Awards Reception

Great Room Pre-Function Area,
3rd Floor

7:00 PM

Awards Banquet*

Great room B & C, 3rd Floor

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 with an asterisk (*) will require a ticket for entrance.

Welcome to the 97th Annual Meeting of the Poultry Science Association



On behalf of the PSA Board of Directors I want to take this opportunity to welcome you to the 97th annual PSA meeting, celebrating the centennial of our Association. This meeting offers attendees numerous opportunities for professional growth through both formal and informal interactions with colleagues. It also affords us a time to renew acquaintances, catch up with old friends, and make some new friends and contacts throughout the week. We all gain something through the course of the meeting, and it is my sincere hope that you will take full advantage of the opportunities that the meeting holds for professional and personal gain.

This meeting is unique in that we are celebrating the centennial year of the Poultry Science Association. We will hold many special events throughout the meeting to highlight our history and challenge us to consider the future. Beginning with the opening session, you will have a once-in-a-lifetime opportunity to see and relive our heritage and acknowledge—the great foundation upon which our association has been built. We will have numerous posters from academia, industry, and special groups on display throughout the meeting, and a copy of these posters is provided in your registration packet. This project has been coordinated by Dr. Frank Robinson with contributions from many individuals and groups. Another highlight will be a special symposium organized by Dr. Robert Taylor to showcase several landmark contributions to *Poultry Science*. These landmark papers will be re-presented along with a look to the future from an award-winning graduate student paper. The PSA Foundation, led by Dr. James Denton, is sponsoring a fund-raising auction (online and silent) with a number of very attractive items over a wide range of value so that everyone will have a chance to be involved in this worthy effort and, additionally, come home with a nice souvenir to commemorate the meeting. At the awards banquet we will be providing a special favor coordinated by Dr. Louis Arrington that will surely become a collector's item. Dr. Frank

Robinson has led the committee that organized and coordinated these activities through the active support of many others who led individual projects.

The program chair for this meeting is Dr. Muquarrab Qureshi, and the quality of the program is evidence of the long hours and hard work that have been devoted to this task. Section chairs for the meeting are Dr. Anne Fanatico (Behavior and Well-Being), Dr. Craig Coufal (Environment and Management), Dr. Kenneth Macklin (Extension and Instruction), Dr. Huaijun Zhou (Genetics), Dr. Rodney Dietert (Immunology), Dr. Amy Batal and Dr. Stephanie Frankenbach (Metabolism and Nutrition), Dr. Shayan Sharif (Pathology), Dr. Ramesh Ramachandran (Physiology Endocrinology and Reproduction), Dr. Marcos Sanchez (Processing, Products and Food Safety), and Dr. Chris Ashwell (Posters). These individuals have contributed countless hours to organize and produce this meeting and are very deserving of our grateful thanks. Please convey your appreciation of their efforts as you encounter them during the meeting.

The board of directors with the support of our executive director, Dr. Jim Kessler, has worked diligently to support the many committees that are involved with this meeting. Many of you served PSA through award committees, session chairs, presentation judges, and the numerous other components that make this meeting what it is. I am proud to be associated with such a devoted group and this meeting is what it is due to your service to PSA. We are also indebted to Mary Swenson, Susan Pollock, Keely Roy, Debi Seymour, and many other FASS staff members who have provided excellent support for this meeting. We owe a tremendous thanks to Dr. Jim Kessler for his central role in coordinating all facets of the meeting as well as the operations of PSA; please be sure to thank Dr. Kessler when you see him at the meeting.

Enjoy your stay in Niagara Falls and take advantage of all that this meeting has to offer.

—John Carey
PSA President

2008 PSA Annual Meeting Important Contact Information

Greater Niagara General Hospital.	905-358-0171
5546 Portage Road	
PSA Business Office	217-356-5285
Sheraton on the Falls	905-374-4445
Brock Plaza	800-263-7135
Hampton Inn	800-465-6027

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 Fallsview Studio B.

Continuing Education

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

On-Site Registration

Registration will be located in Fallsview Studio B, 3rd floor. Registration hours for the 2008 PSA Annual Meeting, including special symposia and other events will be as follows:

Saturday, July 19	3:00 PM – 7:00 PM
Sunday, July 20	7:00 AM – 8:00 PM
Monday, July 21.	7:00 AM – 5:00 PM
Tuesday, July 22.	7:00 AM – 4:00 PM
Wednesday, July 23.	7:30 AM – Noon

Awards Banquet Tickets

Tickets for the Awards Banquet on Wednesday, July 23 will be available on-site as space allows, so get them early! You may purchase tickets at the registration desk, Fallsview Studio B, 3rd floor.

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

Upper Fallsview Studio B (5th floor)

Poster Presentation

The boards will be **4' high and 8' wide**. **Presenters must furnish their own push pins or velcro**. Posters must be in place by 8:00 AM on the day of your scheduled presentation and removed at 5:00 PM of the presentation day. Presenting authors are asked to be present at their poster from 8:00 – 10:00 AM.

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 Upper Fallsview Studio B (5th Floor). 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, Upper Fallsview Studio B (5th floor) 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 Upper Fallsview Studio A 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 Room to be announced

Job Resource Center Hours:

Monday & Tuesday – 7:30 AM – 4:00 PM

Wednesday – 7:30 AM – 12:00 PM

PSA 2008 Events

PSA BBQ

Come and join us at the most attended event of the week, the 2008 PSA BBQ. Share a meal, enjoy the sites and get reacquainted with old friends. This year's picnic will be held at the Niagara Parks Commission Queenston Heights Park Pavilion #1, from 6:00 PM to 10:00 PM. This park is the site of a War of 1812 battle. Shuttle service will be provided starting at 5:00 PM, with return service beginning at 8:00 PM. Please meet in the Sheraton Hotel lobby, tickets for the event are required.

PSA Awards Banquet

Please join us as we celebrate 100 years of the Poultry Science Association and an evening of honoring the 2008 award winners. All meeting participants, spouses and friends are welcome at this event. The banquet will be held on Wednesday, July 23 at the Sheridan on the Falls Hotel in Great Room B & C. The evening is sure to be a good time for all and an excellent time to renew old acquaintances or meet new friends. Please be sure to purchase your ticket in advance. There will be a limited number of tickets available for purchase at the registration desk at Fallsview Studio B, 3rd floor.

Hospitality Lounge Room to be announced

PSA 97th Annual Meeting Sponsors

Gold Level (\$5,000–\$15,000)

Alpharma Animal Health
DSM Nutritional Products, Inc.
Elanco Animal Health
Jones –Hamilton Company
Kemin Americas, Inc.
Monsanto Company
National Research Initiative / USDA / CSREES
Novus International, Inc.

Silver Level (\$1,500–\$4,999)

Adisseo USA, Inc.
Alltech, Inc.
Ajinomoto Heartland LLC
Archer Daniels Midland Co.
Aviagen, Inc.
Canadian Bio-Systems, Inc.
Cargill Animal Nutrition
Cobb-Vantress, Inc.
Danisco Animal Nutrition
Evonik Degussa Corporation
Hy-Line International
Maple Leaf Farms, Inc.
Southern Poultry Science Society
Syngenta Biotechnology, Inc.
Tyson Foods, Inc.
Zinpro Corporation

Bronze Level (up to \$1,499)

Agricultural Biotechnology Stewardship Technical Committee
Akey, Inc.
Alternative Design Mfg.
BASF Plant Science
Biomim America, Inc.
California Pellet Mill
Chr. Hansen, Inc.
Diamond V Mills
Hawkeye Steel Products, Inc.
Hendrix-Genetics
Huvepharma, Inc.
Midwest Poultry Federation
Nicholas Turkey
Phytex LLC
Quality Technology International, Inc.
Ridley Feed Ingredients

PSA 97th Annual Meeting Award Sponsors

Alltech, Inc.
American Egg Board
American Feed Industry Association
American Poultry Historical Society
Embrex, Inc.
Evonik Degussa Corporation
Hy-Line International
Land O'Lakes
Merial Select, Inc.
National Chicken Council
National Turkey Federation
Nicholas Turkey
Perdue Farms, Inc.
Phibro Animal Health
Poultry Science Association
Tyson Food, Inc.
United Egg Producers

PSA Meeting Exhibitors

Alltech, Inc.
Alternative Design Mfg.
Biomim USA, Inc.
Chaloupka
GTC Nutrition
Texas Tech University / ICFIE
Twin Oxide USA

Sunday, July 20

SYMPOSIA AND ORAL SESSIONS

Keynote Symposium

Chair: **Geraldine Huff, USDA/ARS**
Great Room B & C

8:00 AM **Welcome.**
Geraldine Huff - Chair, Keynote Symposium Committee.

8:05 AM
Introductory remarks by symposium chair.
Daniel Perez, Department of Veterinary Medicine, University of Maryland. Director of the AICAP Program.

8:10 AM 1
Network research and education structures to prevent and control pandemic avian influenza.
D. R. Perez*¹ and AICAP Network², ¹*University of Maryland, College Park*, ²*Multiple Institutions Across the USA*.

8:55 AM
Keynote address.
Ilaria Capua, DVM. Istituto Zooprofilattico Sperimentale delle Venezie, Italy
FAO and OIE, Italy.

8:55 AM 2
AI infection in animals: A challenge and opportunity for the poultry veterinarian.
I. Capua*¹ and D. J. Alexander², ¹*OIE/FAO and National Reference Laboratory for Avian Influenza and Newcastle Disease, Istituto Zooprofilattico Sperimentale delle Venezie, Padova, Italy*, ²*Virology Department Veterinary Laboratories Agency, Weybridge Addlestone, Surrey, UK*.

9:40 AM
“Shots are for the birds: Human pandemic concerns, trade issues and vaccination programs are not”.
Michael Lilburn, CAST Board Member Representing PSA, OARDC/OSU, Wooster, OH.

9:50 AM
Break.

10:10 AM

Session I - Vectors.

10:10 AM

The ecology of AIV in wild birds:

What does this mean for poultry?

Erica Spackman, USDA/ARS/SEPRL. Athens, GA.

10:30 AM 3

Evaluation of methods for the detection and characterization of avian influenza viruses from wild ducks in the southeastern United States.

J. Giambrone*, T. Dormitorio, and K. Guo, *Auburn University, Auburn, AL.*

10:50 AM

Live bird markets as a source of avian influenza virus.

Carol Cardona, University of California, Davis.

11:10 AM

Session II - Vaccines.

11:10 AM 4

A gene-based avian influenza vaccine.

S. S. Rao*¹, W. -P. Kong¹, C. -J. Wei¹, D. Perez², D. K. Styles³, Z. Z. Yang¹, C. Murray¹, A. Ault¹, C. Andrews¹, and G. J. Nabel¹, ¹*Vaccine Research Center, NIH, Bethesda, MD*, ²*University of Maryland, College Park*, ³*USDA, Maryland.*

11:30 AM 5

Protection of chickens against avian influenza with non-replicating adenovirus-vectored vaccine.

H. Toro*¹ and D. C. Tang², ¹*Auburn University, Auburn, AL*, ²*Vaxin Inc., Birmingham, AL.*

11:50 AM 6

Development and evaluation of a potential universal *Salmonella*-vectored avian influenza vaccine.

B. M. Hargis*¹, S. L. Layton¹, D. R. Kapczynski³, K. Cole¹, M. M. Cox¹, Y. M. Kwon¹, L. R. Berghman², K. Liljebjelke³, and W. J. Bottje¹, ¹*Department of Poultry Science, University of Arkansas, Fayetteville*, ²*Department of Poultry Science, Texas A&M University, College Station*, ³*Southeast Poultry Research Laboratory, ARS/USDA, Athens, GA.*

12:10 PM

Lunch.

1:10 PM

Session III- Public health.

1:10 PM 7

The public health impact of avian influenza viruses.

J. M. Katz*, K. Hancock, V. Veguilla, J. A. Belser, T. R. Maines, N. Van Hoeven, C. Pappas, and T. M. Tumpey, *Centers for Disease Control and Prevention, Atlanta, GA.*

1:30 PM 8

Surveillance efforts through the NIAID Influenza Centers of Excellence (CEIRS) and resources available to the scientific community.

D. J. Post*, *DMID/NIAID/NIH, Bethesda, MD.*

1:50 PM 9

Pandemic influenza planning: Shouldn't swine & poultry workers be included?

G. C. Gray*, *University of Iowa College of Public Health, Iowa City.*

2:10 PM

Break.

2:25 PM

Session IV- Product marketability.

2:25 PM 10

Canadian experiences with AI: A look at regional disease control, past, present and future.

J. P. Vaillancourt*, *University of Montreal, St-Hyacinthe, PQ, Canada.*

2:45 PM 11

AI monitoring plan in Texas, how it was developed and how the plan has worked in the face of outbreaks, with reference to export market access.

J. B. Carey*, *Texas A&M University, College Station.*

3:05 PM

Panel Discussion: All Speakers.

Moderators: Daniel Perez and Geraldine Huff.

Symposium: Current and Future Prospects for Natural and Organic Poultry

**Chair: Steven C. Ricke and Frank T. Jones, Food
Science Department and Center of Excellence for
Poultry Science, University of Arkansas
Strategy 1**

8:00 AM 12

Current and future prospects for organic poultry: Symposium introduction.

F. T. Jones* and S. C. Ricke, *University of Arkansas, Fayetteville.*

8:10 AM 13

Organic poultry, consumer perceptions and regulatory issues.

P. G. Crandall*¹, E. C. Friedly¹, M. Patton¹, S. Seideman¹, S. C. Ricke¹, C. A. O'Bryan¹, A. F. Fanatico², and R. Rainey¹, ¹*University of Arkansas, Fayetteville,* ²*National Center for Appropriate Technology, Fayetteville, AR.*

8:40 AM 14

Overview of natural and organic egg production: Looking back to the future.

K. E. Anderson*, *North Carolina State University, Raleigh.*

9:10 AM 15

Organic poultry production in the U.S.: Broilers.

A. C. Fanatico*¹, C. M. Owens², and J. L. Emmert², ¹*National Center for Appropriate Technology, Fayetteville, AR,* ²*University of Arkansas, Fayetteville.*

9:40 AM

Break.

10:00 AM 16

Feeding beneficial bacteria: A natural solution for increasing efficiency and decreasing pathogens.

M. R. Garner*, *MicroBios, Inc., Ithaca, NY.*

10:30 AM 17

Antimicrobials for foodborne pathogen reduction in organic and natural poultry production.

S. C. Ricke*, *Center for Food Safety, IFSE, University of Arkansas, Fayetteville.*

11:00 AM 18

Issues in organic poultry processing: Safety, quality and plant considerations.

M. X. Sánchez-Plata*, *Department of Poultry Science, Texas A&M University, College Station.*

11:30 AM

Round Table - All Speakers.

Frank Jones and Steve Ricke, University of Arkansas.

Informal Nutrition Symposium

Modulating Immunity: The Role of Nutrition, Disease, Genetics and Epigenetics. “In Honor of our Great Academic Advisors and Life Mentors”

Recognitions and Award Presentations

Chair: Mamduh Sifri, Archer Daniels Midland

Alliance Nutrition, Inc., Quincy, Illinois

Strategy 2

1:00 PM

Team Members: Roselina C. Angel, University of Maryland; Chris M. Ashwel, North Carolina State University; Wilhelm Guenter, University of Manitoba; Doug Korver, University of Alberta; William W. Saylor, University of Delaware.

1:00 PM

Symbolism for the advisor and the mentor: How did they help us get here?

Mamduh Sifri, ADM Alliance Nutrition, Inc., Quincy, Illinois.

1:15 PM

Immunity lessons from the pioneers: An overview.

Michael H. Kogut, USDA-ARS, Texas.

1:30 PM

Impact of nutrition on the innate immune response to infection in poultry.

Michael H. Kogut, USDA-ARS, Texas.

2:00 PM

Nutritional influences on development of early innate immunity.

Jennifer Saunders-Blades, Raven Kirschenman, Melissa Johnson and Doug Korver, University of Alberta, Canada.

2:35 PM

Dietary modulation of the immune system.

Rami A. Dalloul and Audrey McElroy, Virginia Tech, Blacksburg.

3:10 PM

Break.

3:20 PM

Impact of genetic selection for growth and immunity on resource allocation.

P. B. Siegel and C. F. Honaker, Virginia Tech, Blacksburg.

3:55 PM

The role of epigenetics in improving animal health and metabolism.

Chris M. Ashwel, North Carolina State University.

4:30 PM

Discussions, conclusions, messages and recommendations.

Wilhelm Guenter, University of Manitoba, Canada.

5:00 PM

Adjourn with a meaningful message and a great appreciation of our mentors and advisors.

Monday, July 21

Metabolism and Nutrition - I : Amino Acids

**Chair: Alex Corzo, Mississippi State University
Strategy 2**

8:00 AM 19

Dietary protein composition influences expression of intestinal peptide transporter, PepT1, mRNA in two lines of broilers.

E. R. Gilbert*¹, H. Li¹, D. A. Emmerson², K. E. Webb, Jr.¹, and E. A. Wong¹, ¹*Virginia Polytechnic Institute and State University, Blacksburg*, ²*Aviagen, Huntsville, AL*.

8:15 AM 20

An economic analysis of L-Threonine in a broiler grower diet, using a least-cost model, based upon digestible amino acids and ideal digestible amino acid ratios.

N. Sriperm*², P. B. Tillman¹, G. M. Pesti², and M. E. Wetzstein³, ¹*Ajinomoto Heartland LLC, Chicago, IL*, ²*Department of Poultry Science, University of Georgia, Athens*, ³*Department of Agricultural Economics, University of Georgia, Athens*.

8:30 AM 21

The effect of selection for body weight along at 16 weeks on the lysine and TSAA requirement of turkeys.

O.C. Aimiwu* and M.S. Lilburn, *The Ohio State University/OARDC, Wooster*.

8:45 AM 22

Strain and immune status affect body protein metabolism and lysine requirements in broilers.

R. D. Kirschenman*, S. Moehn, and D. R. Korver, *University of Alberta, Edmonton, AB, Canada.*

9:00 AM 23

Digestible lysine and threonine requirements of male turkeys from days 8 to 21, and days 29 to 42.

L. B. Linares*¹, E. A. Guaiume¹, R. A. Murarolli¹, R. E. Shirley², D. Hoehler³, D. R. Ledoux¹, and J. D. Firman¹, ¹*University of Missouri, Columbia*, ²*Ajinomoto Heartland LLC, Chicago, IL*, ³*Evonik Degussa Corporation, Kennesaw, GA.*

9:15 AM 24

The effect of dietary protein level and digestibility on the growth performance of broiler chickens.

G. P. Widyaratne* and M. D. Drew, *University of Saskatchewan, Saskatoon, SK, Canada.*

9:30 AM 25

Lysine and threonine responses in Ross TP16 broilers.

D. L. Everett*¹, A. Corzo¹, B. J. Kerr², W. A. Dozier, III³, and M. T. Kidd¹, ¹*Mississippi State University, Mississippi State*, ²*USDA-ARS, Ames, IA*, ³*USDA-ARS, Mississippi State, MS.*

9:45 AM 26

The effect of genotype, choice-feeding and season on organically-reared broilers fed diets devoid of synthetic methionine.

A. L. Rack*, K. G. S. Lilly, K. R. Beaman, C. K. Gehring, and J. S. Moritz, *West Virginia University, Morgantown.*

10:00 AM

Break.

10:15 AM 27

Effects of supplemental lysine sources on egg-production and economic parameters for laying hens.

S. Roberts*¹, S. Gardner¹, S. Mottet¹, B. Kerr², D. Hoehler³, R. Payne³, and K. Bregendahl¹, ¹*Iowa State University, Ames*, ²*USDA/ARS, Ames, IA*, ³*Evonik Degussa, Kennesaw, GA.*

10:30 AM 28

The effects of varying levels of digestible lysine on growth and carcass development in commercial turkey toms from 12 to 16 and 17 to 20 weeks.

O. C. Aimuwu* and M.S. Lilburn, *The Ohio State University, Wooster.*

10:45 AM 29

Effects of dietary lysine and energy combinations on net energy partitioning for protein and fat deposition in starter chicks.

S. Gomez*, M. L. Angeles, E. Ramirez, and J. A. Bravo,
CENIDFyMA - INIFAP, Ajuchitlan, Queretaro, Mexico.

11:00 AM 30

Dietary lysine requirement of male broilers from 14 to 28 days of age subjected to different environmental conditions.

W. A. Dozier, III*¹, A. Corzo², M. T. Kidd², and P. Tillman³, ¹*USDA-ARS Poultry Research Unit, Mississippi State, MS*, ²*Department of Poultry Science, Mississippi State, MS*, ³*Ajinomoto Heartland LLC, Chicago, IL.*

11:15 AM 31

Threonine-to-lysine ratios for female broilers from 14 to 28 days of age.

A. Corzo*¹, W. A. Dozier, III², M. T. Kidd¹, and P. Tillman³,
¹*Mississippi State University, Mississippi State*, ²*USDA-ARS Poultry Research Unit, Mississippi State, MS*, ³*Ajinomoto Heartland LLC, Chicago, IL.*

11:30 AM 32

Supplementing L-Valine and L-Isoleucine in low protein corn – soybean meal all vegetable diets for broilers.

J. Berres, S. L. Vieira*, A. K. Ferreira, R. Barros, P. X. Silva, and F. V. F. Furtado, *UFRGS, Porto Alegre, RS, Brazil.*

11:45 AM 33

Digestible lysine requirements and ideal amino acid ratios in diets for young (0-14d) male broilers formulated to ideal ratios and balanced in amino acids.

F.G. P. Costa*², Z. Wang¹, C. Coto¹, S. Cerrate¹, F. Yan¹, and P. W. Waldroup¹, ¹*University of Arkansas, Fayetteville*, ²*Federal University of Paraiba, Areia-PB, Brazil.*

National Extension Workshop

**Chair: Jennifer Timmons,
University of Maryland
Strategy 3**

8:00 AM 34

Washington update.

R. D. Reynnells*, *USDA/CSREES/PAS, Washington, DC.*

8:15 AM 35

The role of professional societies in addressing bioethical issues.

M. P. Lacy*, *University of Georgia, Athens.*

8:30 AM

PACCO (Professional Animal Auditors Certification Organization, Inc.) Update.

Karen Christensen, O. K. Farms, Inc, Fort Smith, AR.

8:45 AM

Panel: Future expectations of extension.

8:45 AM 36

Future expectations of extension: A student's perspective.

L. M. Stevenson*, *Auburn University, Auburn, AL.*

8:55 AM

Future expectations of extension: Industry.

Drew Giesen, Novus International, Inc., Defiance, MO.

9:05 AM 37

Future expectations of extension: A faculty member perspective.

A. J. Pescatore*, *Department of Animal and Food Sciences, University of Kentucky, Lexington.*

9:15 AM 38

Future expectations of Extension: Administrative perspective.

M. D. Ouart*, *University of Missouri, Columbia.*

9:25 AM

Discussion.

10:00 AM

Break.

10:30 AM

Panel: Extension in the past, present, and future.

10:30 AM 39

Youth and under-served audiences.

F. A. Bradley*, *University of California, Davis.*

10:40 AM 40

Panel: Extension in the past, present, and future B: Production.

G. P. Martin*, *Penn State University Extension, Lancaster.*

10:50 AM 41

Poultry processing.

P. A. Curtis*, *Auburn University, Auburn, AL.*

11:00 AM

Health/Food security.

Billy Hargis, University of Arkansas, Fayetteville, AR.

11:10 AM
Discussion.

11:30 AM
General Discussion.

Physiology I
Chair: Ramesh Ramachandran,
Penn State University
Strategy 5 & 6

8:00 AM 42
Effects of genetics, transport stress, and *Escherichia coli* challenge on hematology and clinical chemistry parameters of turkeys.

G. R. Huff*¹, W. E. Huff¹, N. C. Rath¹, N. B. Anthony², and K. E. Nestor³, ¹USDA/ARS/PPPSRU, Fayetteville, AR, ²University of Arkansas, Fayetteville, ³The Ohio State University, Wooster.

8:15 AM 43
Circadian expression of clock genes in the pineal gland, visual suprachiasmatic nucleus (vSCN) and premammillary nucleus (PMM) in photostimulated turkey hens.
B. Leclerc*, S. Kang, C. Howell, L. Mauro, and M. E. El Halawani, University of Minnesota, St. Paul.

8:30 AM 44
Influences of maternal corticosterone and selection for divergent adrenocortical responsiveness to stress in Japanese quail on egg incubation length and hatchling body weight.
J. B. Schmidt*, S. T. Treese, K. A. Davis, R. M. Andree, and D. G. Satterlee, Louisiana State University Agricultural Center, Baton Rouge.

8:45 AM 45
Influences of maternal corticosterone in Japanese quail selected for contrasting adrenocortical responsiveness on the fertility, hatchability, and embryonic mortality of their eggs.
D. G. Satterlee* and J. B. Schmidt, Louisiana State University Agricultural Center, Baton Rouge.

9:00 AM 46
Alleviation of heat stress in market age broilers by strategic elevation of incubation temperature.
S. Yahav*^{1,2}, E. Oviedo-Rondon², and J. Brake², ¹Animal Science, Bet Dagan, Israel, ²Department of Poultry Science, University of North Carolina, Raleigh.

9:15 AM 47

Serotonergic and catecholaminergic interactions with co-localized dopamine-melatonin neurons in the hypothalamic premammillary nucleus of the female turkey during different reproductive states.

S. W. Kang*, B. Leclerc, L. J. Mauro, and M. E. El Halawani, *University of Minnesota, St. Paul.*

9:30 AM 48

Caprylic acid maintains rooster sperm viability during in vitro storage.

G. Liu*^{1,2}, A. M. Donoghue², K. Venkitanarayanan³, and D. J. Donoghue⁴, ¹*Yangzhou University, Yangzhou, Jiangsu, P.R. China,* ²*PPPSRU, ARS, USDA, Fayetteville, AR,* ³*University of Connecticut, Storrs,* ⁴*University of Arkansas, Fayetteville.*

9:45 AM 49

Differential gene expression in the hypothalamus of neonatal chicks during feeding and fasting.

S. E. Higgins*¹, L. E. Ellestad¹, N. Trakooljul², J. Saliba¹, F. McCarthy³, L. A. Cogburn², and T. E. Porter¹, ¹*University of Maryland, College Park,* ²*University of Delaware, Newark,* ³*Mississippi State University, Starkville.*

10:00 AM

Break.

10:15 AM 50

Physiological status of the broiler embryo during various phases of incubation with a special emphasis on the pipping muscle.

R. Pulikanti*, E. D. Peebles, R. W. Keirs, L. W. Bennett, S. K. Whitmarsh, and M. M. Keralapurath, *Mississippi State University, Mississippi State.*

10:30 AM 51

Changes in cellular localization of Nampt/PBEF/Visfatin in the chicken testis: Influence of sexual maturation.

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

10:45 AM 52

Impaired intestinal villi growth in broiler chicks with navel buttons.

L. T. Kawalilak*, A. M. Franco, and G. M. Fasenko, *University of Alberta, Edmonton, AB, Canada.*

11:00 AM 53

Effects of electrolytic lesions of the medial bed nucleus of the stria terminalis (BSTM) on sexual behavior in male broiler breeders.

D. L. Allen*, W. J. Kuenzel, J. Xie, and A. Jurkevich, *University of Arkansas, Fayetteville.*

11:15 AM 54

Differential neural activation in the septo-hypothalamic region following sexual and agonistic behavior in male broiler breeders.

J. Xie*, W. J. Kuenzel, D. L. Allen, and A. Jurkevich, *University of Arkansas, Fayetteville.*

11:30 AM 55

Investigating the effects of estrogen on Zebra Finch eggshell thickness and eggshell morphology.

S. L. Westmoreland*¹, H. Pourarsalan¹, K. A. Schug³, and J. R. Millam², ¹*Department of Biology, University of Texas, Arlington,* ²*Department of Animal Science, University of California, Davis,* ³*Department of Chemistry, University of Texas, Arlington.*

POSTER PRESENTATIONS

Poster Presentations/Monday

**Chair: Chris Ashwell, N. C. State University
Great Room A**

**Immunology - Chair: R. R. Dietert ,
Cornell University, and Yewande Fasina,
Auburn University**

MP249 Effects of prebiotic and probiotic consumption on serum lipid profile in Iranian Ross broiler chickens.

H. Ziaei*¹, M. A. Karimi Torshizi², M. Bashtani¹, H. Farhangfar¹, H. Naeemipour¹, and A. Zeinali¹, ¹*Birjand University, Birjand Iran,* ²*Tarbiat Modarres University, Tehran, Iran.*

MP250 Evaluation of live vectored *Eimeria* vaccine with CD154 (CD 40L) in broiler chickens.

S. Shivaramaiah*¹, E. V. Eskridge¹, S. L. Layton¹, N.R. Pumford¹, A.D. Wolfenden¹, J.R. Barta², Y.M. Kwon¹, B.M. Hargis¹, and G. Tellez¹, ¹*University of Arkansas, Fayetteville,* ²*University of Guelph, ON, Canada.*

MP251 Evaluation of an inactivated *Salmonella*-recombinant vaccine expressing type A influenza M2e epitopes.

G. Gaona-Ramírez*, S. L. Layton, A. D. Wolfenden, R. E. Wolfenden, N. R. Pumford, G. Tellez, and B. M. Hargis, *University of Arkansas, Fayetteville.*

MP252 Effect of rabbit *sacculus rotundus* antimicrobial peptides on serum antibody titers after vaccination with newcastle disease virus vaccine and avian influenza virus vaccine in chickens.

T. Liu*, R. She, H. Bao, Y. Zhang, and D. Luo, *China Agricultural University, Beijing, China.*

MP253 Influence of in-feed virginiamycin on the systemic and mucosal antibody-mediated immune response of chickens.

J. T. Brisbin*¹, J. Gong², C. A. Lusty¹, P. Sabour², B. Sanei³, P. E. Shewen¹, and S. Sharif¹, ¹*University of Guelph, Guelph, ON, Canada*, ²*Agriculture and Agri-Food Canada, Guelph, ON, Canada*, ³*Ontario Ministry of Agriculture and Food, Guelph, ON, Canada*.

MP254 Production and characterization of monoclonal antibodies against chicken CD40.

C. H. Chen*, D. Abi-Ghanem, L. Njongmeta, W. Mwangi, S. Waghela, N. Ing, and L. R. Berghman, *Texas A&M University, College Station*.

MP255 Expression of anti-microbial peptide genes in chicken cecal tonsils after treatment with probiotics and challenge with *Salmonella*.

M. R. Akbari¹, H. R. Haghighi*¹, J. R. Chambers², and S. Sharif¹, ¹*University of Guelph, Guelph, ON, Canada*, ²*Agriculture and Agri-Food Canada, Guelph, ON, Canada*.

MP256 Reactive oxygen species production of chicken heterophils and peripheral blood mononuclear cells in response to the dectin-1 specific agonist, curdlan.

J. Nerren* and M. Kogut, *United States Department of Agriculture, College Station, TX*.

MP257 Regulation of thymosin beta 4 in chicken macrophages by toll like receptor activation.

L. Kannan*^{1,2}, R. Liyanage², J. O. Lay Jr², and N. C. Rath¹, ¹*PPPSRU, ARS, USDA, Fayetteville, AR*, ²*University of Arkansas, Fayetteville*.

MP258 Macrophage-conditioned media enhances lymphocyte proliferation.

L. A. Flatow* and K. C. Klasing, *University of California, Davis*.

MP259 Glucose availability alters chicken thymocyte interleukin-7 receptor gene expression, T cell receptor rearrangement and T cell differentiation.

B. D. Humphrey*¹ and S. G. Rudrappa², ¹*California Poly Tech, San Luis Obispo*, ²*University of Maryland, College Park*.

MP260 Challenging Hy-Line W36 chicks with KLH in conjunction with retinyl palmitate does not increase antibody response regardless of vitamin A status.

K. A. Livingston*, T. W. Perano, and K. C. Klasing, *University of California, Davis*.

**Physiology, Endocrinology, and Reproduction -
Chair: Ramesh Ramachandran,
Penn State University**

MP261 Intratracheal administration of bacterial lipopolysaccharide elicits pulmonary hypertension in broilers with primed airways.

A. G. Lorenzoni* and R. Wideman, *University of Arkansas, Fayetteville.*

MP262 Fertility assessment of male Japanese Quail bird by the size of their cloacal gland.

B. K. Biswas* and K. L. Arora, *Fort Valley State University, Fort Valley, GA.*

MP263 Fertility and embryonic development in Japanese Quail eggs following removal of males.

K. L. Arora*, *Fort Valley State University, Fort Valley, GA.*

MP264 Influence of plasma lipid composition on blood clotting activity in laying hens.

E. Yeh*, D. Wood, and E. J. Squires, *University of Guelph, Guelph, ON, Canada.*

MP265 Ontogenic characterization of gene expression in the developing neuroendocrine system of the chick.

L. E. Ellestad*^{1,2}, J. Saliba¹, and T. E. Porter^{1,2}, ¹*Department of Animal and Avian Sciences, University of Maryland, College Park,* ²*Molecular and Cell Biology Program, University of Maryland, College Park.*

MP266 Complete spermatogenesis from testicular tissue allotransplants in Japanese quail.

Y. Song*^{1,2}, K. Cheng¹, and F. G. Silversides², ¹*University of British Columbia, Vancouver, Canada,* ²*Agriculture and Agri-Food Canada, Agassiz, BC, Canada.*

MP267 The need for yolk, yolk granules, and cholesterol by the chicken embryo.

R. E. Austic* and K.-N. Hsu, *Cornell University, Ithaca, New York.*

MP268 Culturing the chick embryo *in ovo* using cholesterol-reduced egg yolk.

K.-N. Hsu* and R. E. Austic, *Cornell University, Ithaca, New York.*

MP269 Time course changes in testicular antioxidant capacity and L-gulonolactone oxidase activity in cockerels.

C. L. Davenport*, A. R. Murphy, Jr., W.G. Patterson, S. F. Lightsey, J. E. Toler, G. P. Birrenkott, Jr., and D. V. Maurice, *Clemson University, Clemson, SC.*

MP270 Changes in vasoactive intestinal peptide immunoreactivity in the brain of nest-deprived native Thai hens.
N. Prakobsaeng¹, N. Sartsoongnoen¹, S. Kosonsiriluk¹, T. Songserm², I. Rozenboim³, M. E. El Halawani⁴, and Y. Chaiseha*¹, ¹*School of Biology, Suranaree University of Technology, Thailand*, ²*Department of Pathology, Kasetsart University, Thailand*, ³*Department of Animal Science, The Hebrew University of Jerusalem, Israel*, ⁴*Department of Animal Science, University of Minnesota, St. Paul.*

MP271 Nicarbazin reduces ZP3 in the perivitelline membrane of White Pekin ducks.
V. P. Reinoso, R. M. Katani, and G. F. Barbato*, *Pennsylvania State University, University Park.*

MP272 Plant-based diets enriched with linseed oil or marine algae modify sperm lipid profiles and fertility parameters in broiler breeders.
C. Coss*^{1,2}, C. Brèque^{1,2}, D. Venne³, M. R. Lefrançois², Y. Chouinard², G. Vandenberg², and J.L. Bailey^{1,2}, ¹*Centre de recherche en biologie de la reproduction, Quebec, PQ, Canada*, ²*Département des sciences animales, Quebec, PQ, Canada*, ³*Couvoir Scott Ltée, Scott Jonction, PQ, Canada.*

MP273 Matrix metalloproteinase in avian bile fluid.
K.S Rasaputra*^{1,2}, N.C Rath², and T.K.S Kumar¹, ¹*University of Arkansas, Fayetteville*, ²*PPPSRU/ARS/USDA, Fayetteville, AR.*

MP274 Dinitrocarbanilide reversibly reduces sperm receptor gene expression in birds.
M. Rogers*, G. Barbato, and R. Katani, *Pennsylvania State University, State College.*

Metabolism and Nutrition - Chair: Amy Batal, University of Georgia, and Stephanie Frankenbach, JBS United

MP275 Changes of biochemical parameters and enzymes activities in broiler chickens with cold induced ascites.
M. Daneshyar, H. Kermanshahi*, and A. G. Golian, *Ferdowsi University of Mashhad, Mashhad, Khorasan Razavi, Iran.*

MP276 Medicinal plants (Marjoram, Sweet Basil and/ or Rosemary) supplementation to broiler diets as feed additives: Effects on performance, carcass traits, immunity and economics.
H. M. Yakout*¹, M. Osman¹, H. Abbas², and W. Farouk², ¹*Poultry Production Dept., Alexandria University, Alexandria, Egypt*, ²*Agriculture Research Center, Cairo, Egypt.*

MP277 Short-term effects of triiodothyronine on hypothyroid chickens.

R. W. Rosebrough*, B. A. Russell, and M. P. Richards, *Animal Biosciences and Biotechnology Laboratory, Beltsville, MD.*

MP278 Performance and egg quality of laying hen fed different sources of zinc.

M. M. Tabatabaei*, H. Aliarabi, A. A. Saki, A. Ahmadi, and S. A. Hossieni Siyar, *Bu-Ali Sina University, Hamedan, Iran.*

MP279 Impact of supplemental vitamin E on humoral immune response and growth performance of broiler chicks.

J. I. Sultan*¹, A. Javed¹, M. Yaqoob², H. Nawaz¹, and M. Yousaf³, ¹*University of Agriculture, Faisalabad, Pakistan,* ²*Department of Livestock Management, University of Agriculture, Faisalabad Pakistan, Faisalabad, Pakistan,* ³*Depte of Poultry Science, Univesity of Agriculture, Faisalabad, Pakistan, Faisalabad, Pakistan.*

MP280 Effects of endoxylanase dose incorporate to layer diet.

K. M. Tounouvi*, *Universite de Lome, Lome, Golfe, Togo.*

MP281 Effect of dietary probiotic and /or prebiotic on humoral immune response of Ross broiler chickens.

H. Ziaie*¹, M. A. Karimi Torshizi², M. Bashtani¹, H. Naeemipour¹, H. Farhangfar¹, and A. Zeinali¹, ¹*Birjand University, Birjand, Khorasan, Iran,* ²*Tarbiat Moddares University, Tehran, Iran.*

MP282 Productive performance and egg quality of brown laying hens from fifty eight to seventy three weeks of age as influenced by level and source of calcium in the diet.

H. M. Safaa^{1,2}, M. P. Serrano², D. G. Valencia², M. Frikha², X. Arbe³, R. Lázaro², and G. G. Mateos*², ¹*Animal Production Department, Cairo University, Cairo, Egypt,* ²*Universidad Politécnica de Madrid, Madrid, Spain,* ³*Cantos Blancos S.A., Guadalajara, Spain.*

MP283 The effect of different levels of Iranian grass pea (Lathyrus sativus) grain on growth performance of Ross broilers.

Z. Amirabadi¹, A. Riasi*¹, M. H. Fathi Nasri¹, H. Janmohamadi², and H. Farhangfar¹, ¹*University of Birjand, Birjand, Iran,* ²*University of Tabriz, Tabriz, Iran.*

MP285 Effects of feed-borne Fusarium mycotoxins on brain regional neurochemistry of turkeys.

C. K. Girish*¹, E. J. MacDonald², M. Scheinin³, and T. K. Smith¹, ¹*University of Guelph, Guelph, ON, Canada,* ²*University of Kuopio, Kuopio, Finland,* ³*University of Turku and TYKSLAB, Turku, Finland.*

- MP286 Non-starch polysaccharide content of corn grain.**
N. E. Ward*¹, B. A. Slominski², and S. R. Fernandez³, ¹*DSM Nutritional Products Inc., Parsippany, NJ*, ²*University of Manitoba, Winnipeg, Canada*, ³*DSM Nutritional Products Inc., Mexico*.
- MP287 Effects of dietary fat type and different levels of vitamin E on performance and some of eggs characters of broiler breeder.**
H. Aghdam Shahriar*¹, M. Shivazad², M. Chamani¹, K. Nazer_adl¹, and Y. Ebrahim Nezhad¹, ¹*Azad University Shabestar Branch, Azarbyjan Shargi, Iran*, ²*Azad University Research & Science Tehran Branch, Tehran, Iran*.
- MP288 Effect of graded supplementation of threonine on broiler growth and carcass responses during twenty one-to-forty two days of age.**
G. Asghar*, *Hi-Tech Poultry Breeders, Lahore, Pakistan*.
- MP289 Sensitivity of broiler starters to three doses of a multi-enzyme preparation in maize-based diets.**
A. J. Cowieson*¹, C. E. Gilbert¹, and V. Ravindran², ¹*Danisco Animal Nutrition, Marlborough, Wiltshire, United Kingdom*, ²*Massey University, Palmerston North, New Zealand*.
- MP290 Effects of enzymes supplementation on true metabolizable energy content, and nutrient digestibility of corn fibrous-protein cake in cecectomized and intact roosters.**
C. C. Michelangeli*¹, T. C. Reyes¹, C. Melito², and R. E. Vargas¹, ¹*Universidad Central de Venezuela, Maracay, Aragua, Venezuela*, ²*Laboratorio de Biotecnologia Empresas Polar, Caracas, Venezuela*.
- MP291 Effects of Peach Palm oil (*Bactris gasipaes* H.B.K.) on plasma cholesterol, lipoproteins levels, and thrombocyte aggregation in broilers.**
R. E. Vargas*, G. Baldizan, M. Oviedo, and C. Michelangeli, *Universidad Central de Venezuela, Maracay, Aragua, Venezuela*.
- MP292 Influence of feed form and fiber inclusion in the diet on water and feed intake of chicks.**
E. Jiménez-Moreno¹, J. M. González-Alvarado², A. de Coca-Sinova¹, M. Pérez-Serrano¹, R. Lázaro¹, and G. G. Mateos*¹, ¹*Universidad Politécnica de Madrid, Madrid, Spain*, ²*Universidad Autónoma de Tlaxcala, Tlaxcala, México*.
- MP293 Effects of Diamond V XPCIs on intestinal health and productivity of coccidian challenged laying hens.**
M. Lensing*¹, J. D. Van der Klis¹, L. Castillejos², and I. Yoon², ¹*Schothorst Feed Research, Lelystad, Netherlands*, ²*Diamond V Mills Inc., Cedar Rapids, IA*.

MP294 Influence of micronization (fine grinding) of soybean meal and fullfat soybean on ileal digestibility of amino acids in broiler chickens.

D. G. Valencia, M. P. Serrano, J. Corchero, R. Lázaro, and G. G. Mateos*, *Universidad Politécnica de Madrid, Madrid, Spain.*

MP295 Ileal digestibility of amino acids of pea protein concentrate and soy protein sources in broiler chicks.

D. G. Valencia, M. P. Serrano, M. Frikha, R. Lázaro, and G. G. Mateos*, *Universidad Politécnica de Madrid, Madrid, Spain.*

MP296 A comparative study between HCl insoluble ash and chromic oxide as indigestible markers for the determination of apparent ileal digestibility in poultry.

A. Coca-Sinova¹, E. Jiménez-Moreno*¹, J. M. González-Alvarado², R. Lázaro¹, and G. G. Mateos¹, ¹*Universidad Politécnica de Madrid, Madrid, Spain,* ²*Universidad de Tlaxcala, Tlaxcala, México.*

MP297 Dietary protein composition regulates expression of amino acid transporter and enzyme mRNA in the small intestine of broilers.

E. R. Gilbert*¹, H. Li¹, D. A. Emmerson², K. E. Webb, Jr.¹, and E. A. Wong¹, ¹*Virginia Polytechnic Institute and State University, Blacksburg,* ²*Aviagen, Huntsville, AL.*

MP298 Dietary valine requirement estimates for Ross × Ross 308 male broilers.

A. Corzo*¹, M. T. Kidd¹, and W. A. Dozier, III², ¹*Mississippi State University, Mississippi State,* ²*USDA-ARS Poultry Research Unit, Mississippi State, MS.*

MP299 Efficacy of a novel, clostridial probiotic (*Clostridium butyricum* MIYAIRI 588) in broilers.

M. I. Gracia¹, E. Esteve-García², M. Takahashi³, E. McCartney⁴, M. Schlieper⁵, and J. Sánchez*¹, ¹*Imasde Agroalimentaria, S.L., Madrid, Spain,* ²*IRTA Mas de Bover, Tarragona, Spain,* ³*Miyarisan Pharmaceutical Co. Ltd., Japan,* ⁴*Pen & Tec Consulting, Barcelona, Spain,* ⁵*Mitsui, Japan.*

MP300 Effect of a *Lactobacilli* feed additive supplementation on performance of broilers.

J. Sánchez*¹, M. Bernardeau², R. Roet³, and M. I. Gracia¹, ¹*Imasde Agroalimentaria, S.L., Madrid, Spain,* ²*SORBIAL SAS, France,* ³*RM Associates Ltd., United Kingdom.*

MP301 Comparison of performance and carcass parameters for broilers fed diets containing corn with single and multiple genetically enhanced traits using a combined study analysis.

M. L. Taylor*¹, G. F. Hartnell¹, M. A. Nemeth¹, S. W. Davis², S. G. Riordan¹, D. M. Lucas¹, and K. C. Glenn¹, ¹*Monsanto Company, Creve Coeur, MO,* ²*Colorado Quality Research, Wellington, CO.*

MP302 Standardized ileal amino acid digestibilities in various Western Canadian barley and flax samples for broilers.

A. Bandegan*¹, W. Guenter¹, D. Hoehler², and C. M. Nyachoti¹,
¹University of Manitoba, Winnipeg, Canada, ²Evonik Industries, Kennesaw, GA.

MP303 Performance of 42 day-old broilers fed diets containing mannan oligosaccharides and/or enzymes.

M. C. Oliveira¹, R. H. Marques², R. A. Gravena², and V. M. B. Moraes*², ¹University of Rio Verde, Rio Verde, Goiás, Brazil, ²State University of São Paulo, Jaboticabal, São Paulo, Brazil.

MP304 Performance of broilers fed diets with phytase and reduced nonphytate phosphorus levels.

M. C. Oliveira¹, R. A. Gravena², R. H. Marques², and V. M. B. Moraes*², ¹University of Rio Verde, Rio Verde, Goiás, Brazil, ²State University of São Paulo, Jaboticabal, São Paulo, Brazil.

MP305 Differences in small intestine for broiler lines Cobb vs. Ross in digital morphology.

F. A. Santoyo*, R. Gonzalez, J. Garcia, H. Fimbres, O. Leal, and R. Espinoza, *Universidad Autonoma de Nuevo Leon, Monterrey Nuevo Leon, Mexico.*

MP306 Performance of 21 days old fed with yeasts extract and prebiotic and reared at different temperatures.

V. K. Silva, J. D. T. Silva, R. A. Gravena, R. H. Marques, F. H. Hada, and V. M. B. Moraes*, *State University of São Paulo, Jaboticabal, São Paulo, Brazil.*

MP307 Evaluation of XPC™ and prototypes on aflatoxin challenged broilers.

G. D. Osweiler¹, S. M. Ensley¹, S. Jagannatha¹, D. W. Trampel¹, P. M. Imerman¹, I. Yoon², and D. T. Moore*², ¹Iowa State University, Ames, ²Diamond V Mills, Cedar Rapids, IA.

MP308 Determination of the effects of different levels of crab meal on laying hen production performance and egg yolk pigmentation.

J. L. MacIsaac*¹, H. Evans², and D. M. Anderson², ¹Atlantic Poultry Research Institute, Truro, NS, Canada, ²Nova Scotia Agricultural College, Truro, NS, Canada.

MP309 Effect of dietary protein quality on expression profiles of genes in chick intestine during the early post-hatch period.

H. Li¹, E. R. Gilbert¹, D. Emmerson², K. E. Webb Jr¹, and E. A. Wong*¹, ¹Department of Animal and Poultry Sciences, Virginia Tech, Blacksburg, ²Aviagen, Huntsville, AL.

MP310 Evaluation of jumbo squid meal (*Dosidicus gigas*) in diets for laying hens.

M. E. Carranco¹, M. C. C. Calvo¹, P. Ramírez¹, B. Fuente², S. Carrillo*¹, E. Avila², and F. Pérez-Gil¹, ¹*Instituto Nacional de Ciencias Médicas y Nutrición Salvador Zubirán, Tlalpan, México*, ²*Centro de Enseñanza, Investigación y Extensión en Producción Avícola (UNAM), Tlahuac, Mexico*.

MP311 Storage improves the nutritional characteristics of wheat.

G. Ravindran*, *Massey University, Palmerston North, New Zealand*.

MP312 Determination of optimal levels of non-phytate phosphorus for eggshell quality, production, hatchability, and chick quality in broiler breeder hens.

R. D. Ekmay* and C. N. Coon, *University of Arkansas, Fayetteville*.

MP313 Interference of macronutrient intake and selenium methionine inclusion in broilers diets on bone density.

R. D. Malheiros*¹, F. H. Hada², J. D. T. Silva², I. B. Fernandez¹, C. N. Trava¹, and V. M. B. Moraes², ¹*State University of São Paulo, Dracena, SP, Brazil*, ²*State University of São Paulo, Jaboticabal, SP, Brazil*.

MP314 Response of market turkey toms to diets containing high levels of corn distillers dried grains with solubles.

S. L. Noll* and J. Brannon, *University of Minnesota, St. Paul*.

MP315 Physical and chemical analysis of corn grain from Brazilian Cerrado Region.

S. I. F. Rodrigues*^{1,3}, J. H. Stringhini^{2,5}, C. McManus^{1,5}, M. N. Oliveira³, and A. M. Penz Junior⁴, ¹*Universidade de Brasília, Brasília, DF, Brasil*, ²*Universidade Federal de Goiás, Goiânia, Goiás, Brazil*, ³*Asa Alimentos, Brasília, DF, Brasil*, ⁴*Nutron Alimentos, Campinas, SP, Brazil*, ⁵*CNPq researcher, Brasília, DF, Brasil*.

Environment and Management -

Chair: Craig Coufal, Mississippi State University

MP316 Effect of pine wood shavings, rice hulls and sand on broiler productivity when used as a litter sources.

J. L. Atencio, J. A. Fernandez, A. G. Gernat*, and J. G. Murillo, *Escuela Agrícola Panamericana/Zamorano, Tegucigalpa, Honduras*.

MP317 Administration of mushroom extract to broiler chickens for bifidobacteria enhancement in the gut and feces.

W. L. Willis*, O. S. Isikhuemhen, S. A. Ibrahim, and K. King, *North Carolina Agricultural and Technical State University, Greensboro*.

MP318 The effectiveness of a dietary enzyme (Alltech SSF) on improving corn-soy diets fed to large white turkeys to 12 weeks of age.

J. L. Grimes* and J. L. Godwin, *North Carolina State University, Raleigh.*

MP319 Effect of stocking density on performance, welfare and environmental conditions in meat-turkey production.

F. Sirri*¹, A. Meluzzi¹, C. Fabbri², N. Brina³, and C. Mazzini³,
¹*University of Bologna, Ozzano Emilia, Italy*, ²*Research Center of Animal Production, Reggio Emilia, Italy*, ³*Coopitalia, Casalecchio di Reno, Italy.*

MP320 The effect of various litter treatments on bacterial levels for two consecutive growouts.

K. S. Macklin*, J. P. Blake, and J. B. Hess, *Auburn University, Auburn, AL.*

MP322 Microbial profile of bedding sources for rearing broiler chickens.

B. Saenmahayak*, K. S. Macklin, S. F. Bilgili, J. B. Hess, J. P. Blake, and J. L. Sibley, *Auburn University, Auburn, AL.*

MP323 Application of a traceability system for improving poultry management and food safety in the United Arab Emirates.

A. S. Hussein*, M. A. Fadel, F. Sallabi, and A. Jaffar, *United Arab Emirates University, Al-Ain, United Arab Emirates.*

MP324 Impacts of plant-based diets, dietary phytase, and raising season on broiler mineral retention and litter composition.

N. Bergeron*¹, A. Ouyed², and M. R. Lefrançois¹, ¹*Université Laval, Quebec, PQ, Canada*, ²*Centre de recherche en sciences animales de Deschambault, Deschambault, Quebec, Canada.*

MP325 Induced wing flapping to stimulate deep pectoral myopathy in broilers.

R. J. Lien*, S. F. Bilgili, and J. B. Hess, *Auburn University, Auburn, AL.*

MP326 Effects of probiotic administration on coccidiosis vaccination in broilers.

A. E. Klein*¹, J. Lee¹, M. Farnell¹, L. Oden¹, S. Pohl¹, M. Mohnl², R. Beltran², G. Schatzmayr², S. Fitz-Coy³, C. Broussard³, and D. Caldwell¹, ¹*Texas A&M University, College Station*, ²*Biomin GmbH, Herzogenburg, Austria*, ³*Schering-Plough Animal Health, Summit, NJ.*

MP327 Evaluation of liquid and thermal fog based equipment disinfection for mobile equipment.

R. Alphin, E. Benson*, K. Johnson, M. Dawson, and D. Hougentogler, *University of Delaware, Newark.*

MP328 Broiler performance on a COBAN® anticoccidial program with exposure to a mixed eimeria populaton.

R. C. Van Wyhe*, A. Barri, C. L. Walk, J. R. Sottosanti, C. L. Novak, and A. P. McElroy, *Virginia Polytechnic Institute and State University, Blacksburg.*

MP329 Hatchability of end-of-lay broiler breeder eggs as influenced by cooling during incubation.

J. G. Rabalais*, D. R. Ingram, J. M. Dowden, K. D. Homan, and C. B. Wiggins, *Louisiana State University, Baton Rouge.*

MP330 Comparative use of two enzyme additives in matrices of turkey hen diets on growth efficacy.

R. M. Hulet*¹, T. L. Cravener¹, and T. A. Sefton², ¹*Pennsylvania State University, University Park*, ²*Alltech, Inc., Nicholasville, KY.*

MP331 The effect of degermed-dehulled corn on turkeys reared from 12 to 20 weeks of age.

J. L. Godwin*, J. L. Grimes, M. J. Wineland, V. L. Christensen, and A. G. Gernat, *North Carolina State University, Raleigh.*

MP332 Photoperiod effects on broiler performance.

A. J. Brown*¹, B. D. Fairchild¹, A. B. Webster¹, and R.J. Buhr², ¹*Department of Poultry Science, University of Georgia, Athens*, ²*Russell Research Center, USDA-ARS, Athens, GA.*

MP333 The effect of floor density on growth performance and carcass characteristics of French Guinea broilers.

S. N. Nahashon*¹, N. Adefope¹, A. Amenyenu¹, J. Tyus II^{1,2}, and D. Wright¹, ¹*Institute of Agricultural and Environmental Research, Tennessee State University, Nashville*, ²*Department of Agricultural Sciences, Tennessee State University, Nashville.*

MP334 Bacterial populations of broiler chickens fed yeast products in place of antibiotics.

K. Budgell*², K. Doncaster¹, and B. Rathgeber¹, ¹*Agriculture & Agri-Food Canada, Kentville, NS, Canada*, ²*Nova Scotia Agricultural College, Truro, Canada.*

Monday, July 21

SYMPOSIA AND ORAL SESSIONS

Immunology

Chair: **Mary Delany, University of California at Davis, and Yewande Fasina, Auburn University Strategy 7**

8:30 AM 56

Natural source vitamin E (RRR-Alpha-Tocopheryl Acetate) level in broiler diets modulates expression of some cytokines.

S. S. Block*¹, M. G. Kaiser², E. Beach², M. Sifri³, and S. J. Lamont²,
¹ADM Research, Decatur, IN, ²Iowa State University, Ames, ³ADM Alliance Nutrition, Quincy, IL.

8:45 AM 57

Cytokine gene expression in CD4⁺ and CD8⁺ T cell subsets of chickens infected with Marek's disease virus.

P. Parvizi*, L. Read, M. F. Abdul-Careem, C. Lusty, and S. Sharif,
University of Guelph, Guelph, ON, Canada.

9:00 AM 58

Expression of inflammatory mediators in lungs of ascites-resistant and susceptible broilers in response to microparticles entrapped in the pulmonary vasculature.

K. R. Hamal*, R. F. Wideman, N. B. Anthony, and G. F. Erf,
University of Arkansas, Fayetteville.

9:15 AM 59

Development and initial evaluation of a candidate clostridium perfringens alpha toxin-based necrotic enteritis vaccine utilizing recombinant *Salmonella* as a vaccine vector.

A. Khatiwara*¹, S. L. Layton¹, G. Tellez¹, L. R. Berghman², W. J. Bottje¹, B. M. Hargis¹, and Y. M. Kwon¹, ¹Department of Poultry Science, University of Arkansas, Fayetteville, ²Department of Poultry Science, Texas A&M University, College Station.

9:30 AM 60

Smyth line chicken model for autoimmune disease.

G. F. Erf*, K. D. Bateman, F. Shi, C. T. Trovillion, and B. L. Plumlee, *University of Arkansas, Fayetteville.*

9:45 AM 61

Proteomics of host responses in spleen of chickens infected with Marek's disease virus.

N. Thanthrige-Don*¹, M. F. Abdul-Careem¹, S. C. Burgess², and S. Sharif¹, ¹Ontario Veterinary College, Guelph, ON, Canada, ²Mississippi State University, Mississippi State.

10:00 AM

Break.

10:15 AM 62

Immunostimulatory and anti-tumor effects of plant extracts demonstrated by in vitro culture systems.

S-H Lee*¹, H. S. Lillehoj¹, Y. H. Hong¹, S-I Jang¹, C. Ionescu², and D. Bravo², ¹*Animal and Natural Resources Institute, Agricultural Research Service, USDA, Beltsville, MD*, ²*Pancosma, Le Grand, Saconnex, Switzerland*.

10:30 AM 63

Lysis of human and rabbit erythrocytes by duck sera: Differentiating the alternate from the classic complement pathway.

P. F. Cotter*¹ and R. Murdoch², ¹*Cotter Laboratory, Arlington, MA*, ²*Maple Leaf Farms, Milford, IN*.

10:45 AM 64

Importance of in ovo environment on subsequent immune function and health risks.

R. R. Dietert*, *Cornell University, Ithaca, NY*.

11:00 AM 65

The role of photoperiod and melatonin injection on alleviation of inflammation induced by lipopolysaccharide injection in broiler chickens.

A. O. Abbas*¹, G. M. K. Mehaisen¹, G. L. Hendricks³, A. E. Gehad², and M. M. Mashaly^{1,4}, ¹*Cairo University, Cairo, Egypt*, ²*National Research Centre, Cairo, Egypt*, ³*Pennsylvania State University, State College*, ⁴*Kuwait Institute for Scientific Research, Safat, Kuwait*.

11:15 AM

Open Discussion.

Moderators: R. R. Dietert, M. Delany and Y. Fasina.

Environment and Management - I

Chair: Morgan Farnell, Texas A&M University Strategy 1

1:00 PM 66

Low protein, hydroxy- and keto-amino acid analog supplemented diets for broiler chickens: 1. Performance and carcass weight.

A. Adrizal¹, P. Patterson*¹, C. Angel², and A. Markant³, ¹*Department of Poultry Science, Penn State University, University Park,* ²*Department of Animal & Avian Science, University of Maryland, College Park,* ³*Fresenius Kabi Deutschland, Germany.*

1:15 PM 67

Low protein, hydroxy- and keto-amino acid analog supplemented diets for broiler chickens: 2. Manure nitrogen.

P. Patterson*¹, A. Adrizal¹, C. Angel², and A. Markant³, ¹*Department of Poultry Science, Penn State Univ, University Park,* ²*Department of Animal & Avian Science, University of Maryland, College Park,* ³*Fresenius Kabi Deutschland, Germany.*

1:30 PM 68

Impact of new or recycled litter on broiler performance, litter characteristics and nitrogen mass balance.

C. S. Taylor*^{1,2}, J. L. Bray^{2,1}, J. B. Carey¹, T. E. Cherry², and C. D. Coufal³, ¹*Texas A&M University, College Station,* ²*Stephen F. Austin State University, Nacogdoches, TX,* ³*Mississippi State University, Mississippi State.*

1:45 PM 69

Efficacy of acidic calcium sulfate + (clay or diatomaceous earth) litter formulations against *Salmonella* in broilers.

E. L. Larrison*¹, M. A. Davis¹, J. A. Byrd², J. B. Carey¹, and D. J. Caldwell¹, ¹*Texas A&M University, College Station,* ²*USDA/SPARC, College Station, TX.*

2:00 PM 70

Efficacy study of supplementing Bio-Mos® & Natustat® for growth-promoting antibiotics on broiler performance and yield.

J. Bray*^{1,2}, C. Taylor^{1,2}, T. Cherry¹, J. Carey², T. Sefton³, and J. Pierce³, ¹*Stephen F. Austin State University, Nacogdoches, TX,* ²*Texas A&M University, College Station,* ³*Alltech, Inc, Nicholasville, KY.*

2:15 PM 71

Comparative commercial study on broiler performance between live oocysts Coccidiosis Vaccine-A & live oocysts Coccidiosis Vaccine-B containing the low penetrating *Eimeria tenella*.

N. L. Gaikwad*¹, J. L. Bray¹, and T. E. Cherry¹, ¹*Stephen F. Austin State University, Nacogdoches, TX,* ²*Texas A&M University, College Station.*

2:30 PM

Break.

2:45 PM 72

Using body temperatures to manage broiler house temperature.

E. O. Oviedo-Rondón, M. J. Wineland*, J. H. Small, and H. R. Cutchin, *North Carolina State University, Raleigh.*

3:00 PM 73

Ferric sulfate as a litter amendment for ammonia reduction in broiler houses.

C. W. Ritz*¹, L. A. Harper¹, B. D. Fairchild¹, and V. Johnson²,
¹*University of Georgia, Athens,* ²*Kemira Water Solutions, Inc., Lakeland, FL.*

3:15 PM 74

Evaluation of sulfuric acid application at three levels as a litter treatment for broiler chickens.

J. P. Blake*, J. B. Hess, K. S. Macklin, and C. A. Wilson,
Department of Poultry Science, Auburn University, Auburn, AL.

3:30 PM 75

Evaluation of a liquid aluminum sulfate litter treatment (A-7®) at three application rates for broiler chickens.

J. P. Blake*, J. B. Hess, K. S. Macklin, C. A. Wilson, R. N. Lehman, and F. Kocakaya, *Department of Poultry Science, Auburn University, Auburn, AL.*

3:45 PM 76

Evaluation of acidifying litter treatments for broiler chickens.

J. P. Blake*, J. B. Hess, K. S. Macklin, and C. A. Wilson,
Department of Poultry Science, Auburn University, Auburn, AL.

4:00 PM 77

Litter bacterial levels associated with liquid aluminum sulfate (A7) litter treatment.

K. S. Macklin*, J. P. Blake, and J. B. Hess, *Auburn University, Auburn, AL.*

4:15 PM 78

The fate of avian influenza and Newcastle disease viruses during composting.

J. Guan*, M. Chan, C. Grenier, D. C. Wilkie, B. W. Brooks, and J. L. Spencer, *Canadian Food Inspection Agency, Nepean, ON, Canada.*

4:30 PM 79

Growth performance, carcass characteristics and antibody titer responses to Newcastle and Avian Influenza vaccine in broilers reared on different litter materials.

M. Toghyani*¹, A. Gheisari², and M. Toghyani³, ¹*Department of Animal Science, Islamic Azad University, Isfahan, Iran*, ²*Department of Animal Science, Isfahan Agricultural Research Center, Isfahan, Iran*, ³*Young Researcher Club of Islamic Azad University, Isfahan, Iran*.

4:45 PM 80

Ultrastructural diversity of eggshell quality in some Egyptian local breeds of chicken.

M. M. Fathi*¹ and Y. K. Afifi², ¹*Ain Shams University, Cairo, Egypt*, ²*Animal Production Research Institute, Alexandria, Egypt*.

Metabolism and Nutrition - II : Feed Ingredients
Chair: Joe Mortiz, West Virginia University
Strategy 2

1:00 PM 81

Quality characteristics of distillers dried grains with solubles: Wheat and corn DDGS comparison.

B. A. Slominski*, A. Rogiewicz, C. M. Nyachoti, and K. M. Wittenberg, *Department of Animal Science, University of Manitoba, Winnipeg, Canada*.

1:15 PM 82

Quality characteristics of wheat distillers dried grains with solubles (DDGS).

A. Rogiewicz*¹, B. A. Slominski¹, C. M. Nyachoti¹, A. L. Brule-Babel², and K. M. Wittenberg¹, ¹*Department of Animal Science, University of Manitoba, Winnipeg, Canada*, ²*Department of Plant Science, University of Manitoba, Winnipeg, Canada*.

1:30 PM 83

Dietary corn distiller's dried grains with solubles does not affect generic *E. coli* numbers in the laying hen ceca.

S. Roberts*¹, H. Xin¹, D. Trampel¹, H. Medina², and K. Bregendahl¹, ¹*Iowa State University, Ames*, ²*Sparboe Companies, Litchfield, MN*.

1:45 PM 84

Evaluation of limit feeding corn and DDGS in non-feed withdrawal molt programs for laying hens.

L. Mejia*, P. L. Utterback, C. W. Utterback, C. M. Parsons, and K. W. Koelkebeck, *University of Illinois, Urbana*.

2:00 PM 85

Dried distillers grains with solubles in laying hens ration (Phase II).

M. K. Masa'deh*, P Weber, and S. E. Scheideler, *University of Nebraska, Lincoln.*

2:15 PM 86

Replacement of soybean meal with high protein corn distillers grain in broiler diets.

T. J. Applegate*¹, C. Troche¹, Z. Jiang¹, and T. R. Johnson²,
¹Purdue University, West Lafayette, IN, ²Dairy and Animal Nutrient Management Systems, Noblesville, IN.

2:30 PM 87

Impact of fiber separation on the nutritional value of distillers dried grains with solubles in broiler diets.

R. E. Loar*¹, K. J. Mayo¹, R. Srinivasan¹, M. T. Kidd¹, W. A. Dozier, III², and A. Corzo¹, ¹Mississippi State University, Mississippi State, ²USDA-ARS Poultry Research Unit, Mississippi State, MS.

2:45 PM 88

Effect of high protein distiller's dried grains at various levels on performance of laying hens.

B. Y. Jung*, P. Sedlacek, and A. B. Batal, *University of Georgia, Athens.*

3:00 PM

Break.

3:15 PM 89

Increasing level of non-starch polysaccharides in diets may not reduce metabolizable energy or nitrogen-corrected metabolizable energy of meat and bone meal.

O. A. Olukosi* and O. Adeola, *Purdue University, West Lafayette, IN.*

3:30 PM 90

Feeding full fat oil seeds to laying hens: Effect on production parameters, egg quality and yolk fatty acids.

Z. Hayat^{1,2}, T. N. Pasha*¹, F. M. Khattak¹, G. Cherian³, and M. A. Jabbar¹, ¹University of Veterinary & Animal Sciences, Lahore, Pakistan, ²University College of Agriculture, University of Sargodha, Sargodha, Pakistan, ³Department of Animal Sciences, Oregon State University, Corvallis.

3:45 PM 91

Lipid oxidation products, n-3 fatty acids and egg sensory aspects: Effect of feeding flax and two types of antioxidants.

Z. Hayat*^{1,2}, G. Cherian³, T. N. Pasha¹, F. M. Khattak¹, and M. A. Jabbar¹, ¹University of Veterinary & Animal Sciences, Lahore, Pakistan, ²University College of Agriculture, University of Sargodha, Sargodha, Pakistan, ³Department of Animal Sciences, Oregon State University, Corvallis.

4:00 PM 92

Influence of soybean meal origin on its nutritive value and quality parameters.

S. Sueiro¹, M. Hermida¹, D. G. Valencia², M. P. Serrano², and G. G. Mateos*², ¹*Laboratorio de Mouriscade, Pontevedra, Spain*, ²*Universidad Politécnica de Madrid, Spain*.

4:15 PM 93

Field observation: Effects of long term feeding of soybean meal high in trypsin inhibitors to broiler breeders.

N. Ruiz*¹, E. A. Vargas², and F. de Belalcázar³, ¹*Continental Grain Company, New York, NY*, ²*Avícola de Occidente, Maracaibo, Estado Zulia, Venezuela*, ³*Nutrianálisis, Bogotá, Colombia*.

4:30 PM 94

Nutritional value of imported corn versus locally produced bronze and white sorghum grain when fed to broiler chicks in Nicaragua.

C. Feoli*¹, J. D. Hancock¹, M. G. Viscarra², R. Rodriguez², M. J. Rios², F. J. Baltodano², F. Vargas³, and S. C. Mason⁴, ¹*Kansas State University, Manhattan*, ²*Universidad Nacional Agraria, Managua, Nicaragua*, ³*Asociacion Nacional de Productores de Sorgo, Managua, Nicaragua*, ⁴*University of Nebraska, Lincoln*.

**Metabolism and Nutrition - III: Nutrition
Chair: Amy Batal, University of Georgia
Strategy 7**

1:00 PM 95

Effects of *Echinacea purpurea* fermented juice supplementation through drinking water on performance, serum proteins, and liver enzymes in broilers.

Z. Nasir* and M. A. Grashorn, *Hohenheim University, Stuttgart, Germany*.

1:15 PM 96

Development of a precision-fed ileal digestibility assay utilizing 3-week old broiler chicks.

E. J. Kim*, P. L. Utterback, and C. M. Parsons, *University of Illinois, Urbana*.

1:30 PM 97

Effect of in ovo feeding on turkey embryo intestinal morphology.

J. E. de Oliveira*¹, C. M. Ashwell², Z. Uni³, and P. R. Ferket², ¹*Provimi Research and Innovation Centre, Brussels, Belgium*, ²*North Carolina State University, Raleigh*, ³*Hebrew University, Rehovot, Israel*.

1:45 PM 98

Effects of feed form and fiber inclusion in the diet on digestive traits and nutrient utilization in eight-day-old broilers.

E. Jiménez-Moreno¹, J. M. González-Alvarado², A. de Coca-Sinova¹, J. García¹, R. Lázaro¹, and G. G. Mateos*¹, ¹*Universidad Politécnica de Madrid, Madrid, Spain*, ²*Universidad Autónoma de Tlaxcala, Tlaxcala, México*.

2:00 PM 99

Inhibition of autoinducer-2 activity by saponin rich guar extracts.

R. Kakani, O. Gutierrez*, C. A. Bailey, P. Jesudhasan, and S. D. Pillai, *Texas A&M University, College Station*.

2:15 PM 100

Femoral head disarticulation disorder in chickens.

V. Durairaj*^{1,2}, C. N. Coon¹, W. E. Huff², G. R. Huff², F. D. Clark¹, and N. C. Rath², ¹*University of Arkansas, Fayetteville*, ²*PPPSRU, ARS, USDA, Fayetteville, AR*.

2:30 PM 101

Evaluation of the effect of diet and phytase on broiler performance using a live coccidia oocyst vaccine.

C. L. Walk*¹, C. Wyatt², R. Upton², and A. P. McElroy¹, ¹*Virginia Polytechnic Institute and State University, Blacksburg*, ²*Syngenta Animal Nutrition, Research Triangle Park, North Carolina*.

2:45 PM

Break.

3:00 PM 102

Spleen tissue n-3 and n-6 fatty acid distribution and cyclooxygenase-2 (COX-2) protein expression during lipopolysaccharide challenge in broiler chickens: Effect of dietary lipids and time of feeding.

D. Gonzalez* and G. Cherian, *Oregon State University, Corvallis*.

3:15 PM 103

Influence of turkey genetic selection and parent flock age on embryonic metabolism.

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

3:30 PM 104

Role of phytogetic feed and water supplements in poultry nutrition.

Z. Nasir* and M. A. Grashorn, *Hohenheim University, Stuttgart, Germany*.

3:45 PM 105

Transepithelial HMTBA transport and utilization as methionine source in intestinal Caco-2 cells.

R. Matin-Venegas², Y. Mercier¹, M. J. Rodriguez-Lagunas², P. A. Geraert¹, and R. Ferrer*², ¹*ADISSEO France S.A.S., Commeny, France*, ²*Facultat de Farmacia, Universitat de Barcelone, Barcelona, Spain*.

4:00 PM 106

Processing characteristics of commercial and heritage broilers fed standard or organic diets.

K. Hopkins and M. S. Lilburn*, *The Ohio State University/OARDC, Wooster*.

4:15 PM 107

Influence of soybean meal source and feed form of the diet on performance, organ size and gizzard pH of broilers from 0 to 25 days of age.

F. J. Corchero, G. Brumano, M. P. Serrano, D. G. Valencia, M. Frikha, and G. G. Mateos*, *Universidad Politécnica de Madrid, Spain*.

4:15 PM 108

Comparison of source and levels of sodium in broilers under low temperature condition.

A. Mahmud*¹, Z. Hayat^{1,2}, Z. Ullah¹, M. M. H. Mushtaq¹, and A. Khalique¹, ¹*University of Veterinary & Animal Sciences, Lahore, Pakistan*, ²*University College of Agriculture, University of Sargodha, Sargodha, Pakistan*.

Physiology II

Chair: Gregoy Bédécarrats, University of Guelph Strategy 5 & 6

1:00 PM 109

Effects of in ovo injection of metabolic stimulants on subsequent broiler chick tissue nutrient profiles.

M. M. Keralapurath*, E. D. Peebles, R. W. Keirs, D. A. Braasch, L. W. Bennett, S. K. Whitmarsh, and B. M. McGruder, *Mississippi State University, Mississippi State*.

1:15 PM 110

Effect of photoperiod on upper gastrointestinal tract microbial ecology in broiler chickens.

S. Dalal*¹, U. Fernando¹, K. Schwean-Lardner¹, B. Laarveld¹, H. L. Classen¹, A. V. Kessel¹, and B. Fancher², ¹*University of Saskatchewan, Saskatoon, SK, Canada*, ²*Aviagen, Huntsville, AL*.

1:30 PM 111

T-2 toxin further decreases testicular function in Japanese quail selected for exaggerated adrenocortical stress response.

J. M. Grizzle*¹ and D. G. Satterlee², ¹*University of Tennessee, Knoxville*, ²*Louisiana State University Agricultural Center, Baton Rouge*.

1:45 PM 112

Anatomical and physiological changes in hens molted using non-feed withdrawal.

A. L. McDonald*¹, Y. Vizzier-Thaxton², S. Branton³, C. G. Scanes⁴, J. P. Thaxton², S. W. Anderson², and A. Warlick², ¹*Cal Maine Foods, Jackson, MS*, ²*Mississippi State University, Mississippi State*, ³*USDA South Central Poultry Research Laboratory, Starkville, MS*, ⁴*University of Wisconsin, Milwaukee*.

2:00 PM 113

Cytokine and chemokine gene expression in corticosterone-stressed chickens: A new indicator of stress status?

S. Shini*¹, A. Shini¹, and P. Kaiser², ¹*University of Queensland, Gatton, QLD, Australia*, ²*Institute for Animal Health, Compton, Berkshire, UK*.

2:15 PM 114

Solitary and interactive effects of corticotropin-releasing hormone and vasotocin in control of corticosterone in chickens.

A. Jurkevich*¹, W. J. Kuenzel¹, F. N. Madison^{1,3}, M. V. Mikhailova², and L. E. Cornett², ¹*University of Arkansas, Fayetteville*, ²*University of Arkansas for Medical Sciences, Little Rock*, ³*Hope College, Holland, MI*.

2:30 PM

Break.

2:45 PM 115

Cloning and characterization of chicken prostaglandin E receptor subtype 3 (EP3) and F receptor (FP).

A. H-Y. Kwok*, Y. Wang, C. Y. Wang, and F. C. Leung, *University of Hong Kong, Hong Kong, HK-SAR, China*.

3:00 PM 116

Sexual maturation of blind Smoky Joe chickens is not controlled by photoperiod.

J. Perttula* and G. Bedecarrats, *University of Guelph, Guelph, ON, Canada*.

3:15 PM 117

Identification and characterization of a novel receptor for chicken GHRH and the potential receptor(s) for chicken GHRH-like peptide (GHRH-L) and peptide histidine isoleucine (PHI).

Y. Wang, J. Li, C. Y. Wang, and F. C. Leung*, *University of Hong Kong, Hong Kong, HK-SAR, China*.

3:30 PM 118

Use of dietary thyroxin as an alternate moulting procedure in turkey breeder hens.

V. A. L. Gulde*¹, R. Renema², and G. Y. Bédécarrats¹, ¹*University of Guelph, Guelph, ON, Canada*, ²*University of Alberta, Edmonton, AB, Canada*.

3:45 PM 119

Brain AMP-activated protein kinase and food intake in chickens.

D. M. Denbow* and P. B. Siegel, *Virginia Tech, Blacksburg*.

Processing, Products, and Food Safety

Chair: **Marcos X. Sanchez-Plata,**

Texas A & M University

Strategy 3

1:00 PM 120

Sensory descriptive profiles of air and water chilled broiler breast filets.

H. Zhuang*, E. Savage, D. Smith, and M. Berrang, *ARS-USDA, Athens, GA*.

1:15 PM 121

Effect of multiple washings in salicylic acid on the bacterial flora of the skin of processed broiler chickens.

A. Hinton Jr.* and J. A. Cason, *Russell Research Center, Athens, GA*.

1:30 PM 122

Dietary gelatin supplementation increases *Salmonella typhimurium* levels in the ceca of young chicks.

Y. O. Fasina*, E. T. Moran, D. E. Conner, and S. R. Mckee, *Auburn University, Auburn, AL*.

1:45 PM 123

Gas stunning and quality characteristics of broiler chicken breast meat.

M. Bianchi*, M. Petracci, and C. Cavani, *Alma Mater Studiorum - University of Bologna, Department of Food Science, Cesena, Italy*.

2:00 PM 124

Evaluation of the anti-listeria properties of nisin on ready-to-eat turkey ham.

A. Ruiz¹, S. K. Williams*¹, A. Hinton², G. E. Rodrick¹, and N. Djeri¹, ¹*University of Florida, Gainesville*, ²*USDA ARS Richard B. Russell Agricultural Research Center, Athens, GA*.

2:15 PM 125

Anti-Salmonella properties of Prontech® on commercial poultry broiler meat when inoculated with *Salmonella typhimurium* .

A. Ruiz¹, S. K. Williams*¹, A. Costa², W. Dominguez², and K. C. Sarjeant¹, ¹*University of Florida, Gainesville*, ²*Pan-American School of Agriculture, El Zamorano, Francisco Morazán, Honduras*.

2:30 PM 126

Effects of chlorine or chlorine dioxide during immersion chilling on recovery of bacteria from broiler carcasses and chiller water.

J. K. Northcutt*¹, D. P. Smith², N. A. Cox², K. D. Ingram², R. J. Buhr², L. J. Richardson², J. A. Cason², and A. Hinton, Jr.², ¹*Clemson University, Clemson, SC*, ²*USDA-ARS, Athens, GA*.

2:45 PM 127

***Listeria monocytogenes* biofilm formation on silver ion impregnated cutting boards.**

M. E. Berrang*¹, J. F. Frank², and R. J. Meinersmann¹, ¹*USDA-ARS-Russell Research Center, Athens, GA*, ²*University of Georgia, Athens*.

3:00 PM

Break.

3:15 PM 128

Effect of quartering and sampling method on recovery of bacteria from broiler carcasses.

D. P. Smith*, *USDA, ARS, Athens, GA*.

3:30 PM 129

Effects of post-processing shell surface sanitizers on egg physical quality.

D. R. Jones*¹, S. K. Trabue², J. D. Shaw³, and M. T. Musgrove¹, ¹*USDA-ARS, Egg Safety and Quality Research Unit, Russell Research Center, Athens, GA*, ²*Department of Biological Sciences, Tennessee State University, Nashville*, ³*Department of Food Science, University of Georgia, Athens*.

3:45 PM 130

Evaluation of pulse electric fields to reduce *Salmonella Typhimurium* and *Salmonella enteritidis* levels in scalding water during poultry processing.

B. C. Martin* and M. X. Sánchez-Plata, *Texas A&M University, College Station*.

4:00 PM 131

DOA determination for hanging at processing plant with CAS or LAPS stunning systems.

Y. Vizzier-Thaxton*¹ and K. Christensen², ¹*Mississippi State University, Mississippi State*, ²*OK Industries, Inc., Ft. Smith, AR*.

4:15 PM 132

Dietary conjugated linoleic acid, flaxseed, and menhaden fish oil effect on lipid oxidation stability of *Sous Vide* chicken meat.

C. Narciso-Gaytan*^{1,2}, D. Shin¹, C. A. Bailey¹, A. R. Sams³, and M. X. Sanchez-Plata¹, ¹*Texas A&M University, College Station*, ²*Colegio de Postgraduados, Cordoba, Ver. Mexico*, ³*Clemson University, Clemson. SC*.

4:30 PM 133

External and internal bacteria in broiler chickens before and after defeathering.

J. A. Cason*, A. Hinton, Jr., J. K. Northcutt, R. J. Buhr, K. D. Ingram, D. P. Smith, and N. A. Cox, *Russell Research Center, Athens, GA*.

4:45 PM 134

Supplemental vitamin B6 improves vitelline membrane strength in layer hens fed a flaxseed ration.

M. Pichardo*, J. Lee, C. Creger, C. Ruiz-Feria, J. Carey, D. Hyatt, and M. Farnell, *Department of Poultry Science, Texas A & M University, College Station*.

5:00 PM 135

Efficacy of post-wash shell egg sanitizers.

M. T. Musgrove*¹, S. K. Trabue², J. D. Shaw³, and D. R. Jones¹, ¹*Egg Safety and Quality Research Unit, USDA-ARS, Athens, GA*, ²*Dept. of Biological Science, Tennessee State University, Nashville*, ³*Dept. of Food Science, University of Georgia, Athens*.

Tuesday, July 22

Environment and Management - II

Chair: Casey Ritz, University of Georgia
Strategy 1

8:00 AM 136

Male broiler breeder management: Paradigm and paradox.

J. T. Brake*¹ and H. Romero-Sanchez², ¹*North Carolina State University, Department of Poultry Science, Raleigh*, ²*University of Antioquia, Medellin, Colombia*.

8:15 AM 137

Infrared beak treatment: An alternative to conventional beak trimming.

R. L. Dennis*^{1,2}, A. G. Fahey^{1,2}, and H. W. Cheng², ¹*Purdue University, Department of Animal Sciences, West Lafayette, IN*, ²*Livestock Behavior Research Unit, USDA-ARS, West Lafayette, IN*.

8:30 AM 138

The effects of feeding broiler breeders on different crude protein levels.

D. E. Yoho*, J. R. Moyle, R. S. Harper, and R. K. Bramwell,
University of Arkansas, Fayetteville.

8:45 AM 139

Production performance of broiler breeder hens raised on various growth curves.

J. R. Moyle*, D. E. Yoho, R. S. Harper, and R. K. Bramwell,
University of Arkansas, Fayetteville.

9:00 AM 140

Effect of maternal feed management and maternal efficiency on chick quality, residual yolk utilization, and early growth of broiler chicks.

A. Naeima*¹, M. J. Zuidhof², L. F. Romero¹, R. A. Renema¹, and F. E. Robinson¹, ¹*University of Alberta, Edmonton, AB, Canada*,
²*Alberta Agriculture and Food, Edmonton, AB, Canada.*

9:15 AM 141

Effect of the inclusion of phytase on low available phosphorus broiler breeder diets on fecal moisture.

M. Arguelles-Ramos*¹, J. T. Brake¹, and A. B. Leytem², ¹*North Carolina State University Department of Poultry Science, Raleigh*,
²*USDA-ARS, NISRL, Kimberly, ID.*

9:30 AM 142

Effect of feed space during the growing and laying periods and the rate of feed increase at the onset of lay on reproductive performance and mortality of broiler breeder females.

N. Leksrisompong*, J. T. Brake, and E. Oviedo-Rondon, *North Carolina State University, Department of Poultry Science, Raleigh.*

9:45 AM 143

Hens or roosters: Which gender has a greater impact on fertility and broiler body weights as a flock ages?

M. E. MacKenzie*¹, G. M. Fasenko¹, E. E. O'Dea Christopher¹, J. L. Wilson², and D. P. Froman³, ¹*University of Alberta, Edmonton, AB, Canada*, ²*University of Georgia, Athens*, ³*Oregon State University, Corvallis.*

10:00 AM

Break.

10:15 AM 144

The evaluation of selected disinfectants, chemicals and other agents to inactivate avian influenza virus (AIV).

R. L. Alphin*, K. J. Johnson, B. S. Ladman, M. P. Lombardi, and E. R. Benson, *University of Delaware, Newark.*

10:30 AM 145

Consequences of long term storage conditions and the addition of organic matter on the antimicrobial activity of diluted disinfectants.

K. Stringfellow*¹, P. Anderson¹, D. Caldwell¹, J. Lee¹, J. Byrd², J. McReynolds², J. Carey¹, and M. Farnell¹, ¹*Texas A&M University Department of Poultry Science, College Station*, ²*United States Department of Agriculture Agriculture Research Service, College Station, TX*.

10:45 AM 146

Effects of eggshell sanitation using ultraviolet light and hydrogen peroxide in combination on hatch parameters of broiler breeder eggs.

J. Wells*, C. Coufal, H. Parker, and C. McDaniel, *Mississippi State University, Mississippi State*.

11:00 AM 147

Alterations in gastrointestinal development by incubation temperature and post-hatch transportation in broiler chicks.

A. Barri*¹, M. Wineland², C. Novak³, and A. McElroy¹, ¹*Virginia Polytechnic Institute, Blacksburg*, ²*North Carolina State University, Raleigh*, ³*Virginia Polytechnic Institute, Blacksburg*.

11:15 AM 148

Embryonic incubation temperature, transport stress, and post-hatch age impact gene expression of mucin and heat shock protein in commercial broilers.

J. Sottosanti*, A. Barri, R. Dalloul, and A. P. McElroy, *Virginia Polytechnic Institute and State University, Blacksburg*.

11:30 AM 149

A field comparison of hatch and broiler performance using both single stage and multi-stage incubation.

M.J. Wineland*¹, E.O. Oviedo-Rondon¹, H.R. Cutchin¹, J.H. Small¹, K.M. Mann¹, and J. Beavers², ¹*North Carolina State University, Raleigh*, ²*Mountaire Farms, Siler City, NC*.

11:45 AM 150

The effect of incubation temperature on embryonic development of White Pekin ducks.

J. Bowers*¹, H. Kohl², and M. S. Lilburn¹, ¹*The Ohio State University/OARDC, Wooster*, ²*Maple Leaf Farms, Syracuse, IN*.

Extension and Instruction

**Chair: Kenneth Macklin, Auburn University, and
Jason Lee Texas A & M University
Strategy 5 & 6**

8:00 AM 151

**Update on Professional Animal Auditing Certification
Organization (PAACO).**

K. D. Christensen*^{1,2}, ¹*OK Farms, Inc., Fort Smith, AR*, ²*Mississippi
State University, Starkville.*

8:15 AM 152

**Innovation in the poultry industry: Digital video production for
classroom and web-based learning.**

D. C. Penrice*, F. E. Robinson, and N. J. Wolanski, *University of
Alberta, Edmonton, AB, Canada.*

8:30 AM 153

Learning by teaching to increase student interest in poultry.

R. J. Balander* and D. M. Karcher, *Michigan State University, East
Lansing.*

8:45 AM 154

Using clickers to enhance the student academic experience.

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

Metabolism and Nutrition - IV : Vitamins and Minerals and Feed Manufacturing

**Chair: Curtis Novak,
Land O'Lakes Purina Feeds
Strategy 2**

8:00 AM 155

**Effect of source and level of trace minerals on performance and
egg shell quality.**

M. Daley*¹, A.E. Sefton², and S. Leeson¹, ¹*University of Guelph,
Guelph, ON, Canada*, ²*Alltech Canada Inc., Guelph, ON, Canada.*

8:15 AM 156

**Tissue lipid and vitamin E status of broiler chicks: Effect of in
ovo feeding of vitamin E.**

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

8:30 AM 157

Vitamin E and selenium supplementation in laying hens.

A. A. Aljamal*, M. K. Masa'deh, and S. E. Scheideler, *University of Nebraska, Lincoln.*

8:45 AM 158

Inadequate vitamin A during development increases bursacyte apoptosis in chicks.

K. A. Livingston* and K. C. Klasing, *University of California, Davis.*

9:00 AM 159

Deposition of and performance responses to Zn from 3 organic sources fed to broiler chickens in the presence of cotton seed hull diets containing gossypol.

M. D. Sims*¹ and M. J. de Veth², ¹*Virginia Diversified Research Corp., Harrisonburg, VA,* ²*Balchem Corp., New Hampton, NY.*

9:15 AM 160

The effect of dietary supplementation on egg vitamin content.

M.L. Johnson* and D.R. Korver, *University of Alberta, Edmonton, AB, Canada.*

9:30 AM 161

A dose titration comparison of MINTREX® Zn versus ZnSO4 on performance in broilers with high dietary Cu supplementation.

J. Zhao*, R. B. Shirley, T. R. Hampton, J. D. Richards, R. J. Harrell, J. J. Dibner, P. Winkelbauer, C. D. Knight, M. Vazquez-Anon, and A. F. Giesen, *Novus International Inc, St. Charles, MO.*

9:45 AM 162

Benefits of an organic trace mineral on performance with dietary Cu antagonism in broilers.

J. zhao*, R. B. shirley, T. R. Hampton, J. D. Richards, R. J. Harrell, J. J. Dibner, C. D. Knight, and M. Vazquez-Anon, *Novus International, Inc., St. Charles, MO.*

10:00 AM

Break.

10:15 AM 163

MINTREX® organic trace minerals are more bioavailable and support the antioxidant response more than other trace mineral forms.

J. D. Richards*, C. A. Atwell, P. Winkelbauer, C. W. Wuelling, M. E. Wehmeyer, and J. J. Dibner, *Novus International, Inc., St. Charles, MO.*

10:30 AM 164

Se contents of eggs from broiler breeders fed Se from selenite or Zn-L-Se-methionine.

R.N. Reis¹, S.L. Vieira*¹, P.C. Nascimento², D.M. Freitas¹, and R. Barros¹, ¹*UFRGS, Porto Alegre, RS, Brazil*, ²*UFMS, Santa Maria, RS, Brazil*.

10:45 AM 165

Impact of vitamins and minerals on breeder nutrition.

L. F. Araujo*^{1,2}, C. S. S. Araujo¹, D. Dumwalt¹, A. Corzo¹, C. D. MacDaniel¹, and M. T. Kidd¹, ¹*Mississippi State University, Starkville*, ²*University of Sao Paulo, Pirassununga, SP, Brazil*.

11:00 AM 166

The effect of diet formulation and manufacturing technique on pellet processing variables and quality.

N. P. Buchanan*, K. G. S. Lilly, C. K. Gehring, and J. S. Moritz, *West Virginia University, Morgantown*.

11:15 AM 167

The effect of diet formulation, manufacturing technique, and antibiotic inclusion on broiler growth and development.

N. P. Buchanan*, K. G. S. Lilly, A. L. Rack, K. R. Beaman, and J. S. Moritz, *West Virginia University, Morgantown*.

11:30 AM 168

The effects of fiber, moisture and protein on pellet manufacture variables.

K. G. S. Lilly*, N. P. Buchanan, S. E. Cutlip, and J. S. Moritz, *West Virginia University, Morgantown*.

11:45 AM 169

Effects of diet preconditioning on digestive system morphology in roosters fed increasing levels of guar meal.

O. Gutierrez*, A. Haq, and C. A. Bailey, *Texas A&M University, College Station*.

Pathology

**Chair: Shayan Sharif, University of Guelph
Strategy 7**

8:00 AM 170

Effect of passage through laying hens on organ invasiveness and phenotypic heterogeneity of *Salmonella enteritidis*.

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

8:15 AM 171

Development and evaluation of candidate recombinant *Salmonella*-vectored *Salmonella* vaccines.

R. E. Wolfenden*¹, S. L. Layton¹, A. D. Wolfenden¹, A. Khatiwara¹, G. Gaona-Ramírez¹, N. R. Pumford¹, K. Cole², Y. M. Kwon¹, G. Tellez¹, and B. M. Hargis¹, ¹*University of Arkansas, Fayetteville*, ²*The Ohio State University, Columbus*.

8:30 AM 172

Comparison of vitamin U, BioMos and BMD on *Salmonella* control and intestinal measures.

A. L. Shaw*, K. S. Macklin, and J. P. Blake, *Auburn University, Auburn, AL*.

8:45 AM 173

Control of necrotic enteritis and reduction of environmental level of *Salmonella* with the natural feed additives Natustat and BioMos.

G. Mathis*¹, C. Hofacre², and S. Heintzelman³, ¹*Southern Poultry Research, Inc., Athens, GA*, ²*University of Georgia, Athens*, ³*Alltech, Inc, Lexington, KY*.

9:00 AM 174

Gene expression profiling within the spleen of *Clostridium perfringens*-infected Broilers fed antibiotic-medicated and non-medicated diets.

A. J. Sarson*¹, Y. Wang², Z. Kang¹, H. Yu¹, Y. Han³, H. Zhou², S. Sharif⁴, and J. Gong¹, ¹*Guelph Food Research Centre, Agriculture and Agri-Food Canada, Guelph, ON, Canada*, ²*Texas A&M University, College Station*, ³*Nutreco Canada Agresearch, Guelph, ON, Canada*, ⁴*University of Guelph, Guelph, ON, Canada*.

9:15 AM 175

***Bacillus licheniformis* (GalliPro Tect) prevent necrotic enteritis in broiler chicken.**

I. Knap*¹, B. T. Lund¹, and G. F. Mathis², ¹*Chr. Hansen A/S, Hoersholm, Denmark*, ²*Southern Poultry Research Inc., GA*.

9:30 AM 176

Utility of probiotics as part of an integrated control strategy against coccidiosis in broiler chickens.

J. L. McPherson Komorowski* and J. R. Barta, *Ontario Veterinary College, University of Guelph, Guelph, ON, Canada*.

9:45 AM 177

Effect of some chemical pollutants on the response of chickens to vaccination.

A. A. El Meleigy*¹, S. E. Mesalhy¹, M. M. El Hammamy¹, N. A. Shalaby², and S. F. El Hadad², ¹*Suez Canal University, Ismailia, Egypt*, ²*Animal Health Research Institute, Gharbia, Egypt*.

10:00 AM

Break.

10:15 AM 178

Evidence for *Clostridium septicum* as a primary cause of gangrenous dermatitis (cellulitis) in commercial turkeys.

G. Tellez*, M. J. Marion, N. Pumford, A. Wolfenden, S. Shivaramaiah, E. V. Eskridge, S. L. Layton, R. Wolfenden, G. Gaona-Ramírez, R. L. Brewer, N. Neighbor, C. Lester, and B. M. Hargis, *University of Arkansas, Fayetteville, AR.*

10:30 AM 179

Antibiotic treatment, small group size and strict biosecurity as a method to eradicate *Mycoplasma* and *Salmonella* from novel turkey breeding stock.

B. J. Wood*, N. Buddiger, H. van der Hoef, C. J. Kostal, and A. Ferenz, *Hybrid Turkeys, Kitchener, ON, Canada.*

10:45 AM 180

Evaluation of an inactivated autogenous vaccine for turkey bordetellosis.

N. R. Pumford*, G. Tellez, M. J. Morgan, A. D. Wolfenden, and B. M. Hargis, *University of Arkansas, Fayetteville.*

11:00 AM 181

Bone development and leg problems in four strains of turkeys.

P. E. Eusebio-Balcazar*¹, E. O. Oviedo-Rondón¹, J. Small¹, J. Grimes¹, P. Valdivia², and A. Tercero², ¹*North Carolina State University, Raleigh*, ²*Escuela Agrícola Panamericana Zamorano, Tegucigalpa, Honduras.*

11:15 AM 182

Leg defects and gait patterns on turkey bone biomechanical properties.

E. O. Oviedo-Rondón*¹, P. L. Mente², B. D. X. Lascelles³, J. Grimes¹, P. Ferket¹, and A. Mitchell⁴, ¹*Department of Poultry Science, CALS, North Carolina State University, Raleigh*, ²*Biomedical Program, COE, North Carolina State University, Raleigh*, ³*Department of Clinical Sciences, CVM, North Carolina State University, Raleigh*, ⁴*USDA-ARS, BARC, Beltsville, MD.*

11:30 AM

Open Discussion.

Moderator: Shayan Sharif.

POSTER PRESENTATIONS

Poster Presentations/Tuesday

Chair: **Chris Ashwell, N. C. State University
Great Room A**

Metabolism and Nutrition -

Chair: **Amy Batal, University of Georgia,
and Stephanie Frankenbach, JBS United**

TP335 Correlation and principal component analyses of corn grain from Brazilian Cerrado region.

S. I. F. Rodrigues^{1,3}, J. H. Stringhini*^{1,5}, C. McManus^{1,5}, M. N. Oliveira³, and A. M. Penz Junior⁴, ¹*Universidade de Brasilia, Brasilia, DF, Brasil*, ²*Universidade Federal de Goias, Goiânia, Goiás, Brazil*, ³*Asa Alimentos, Brasilia, DF, Brazil*, ⁴*Nutron Alimentos, Campinas, SP, Brazil*, ⁵*CNPq researcher, Brasilia, DF, Brazil*.

TP336 Performance, organ morphology, and abdominal fat of broilers supplemented with a probiotic and garlic as an alternative to antibiotic growth promoters.

H. Collazos*, S. Triana, and O. Castro, *Universidad Nacional Abierta Y a Distancia Unad, Bogota, Cundinamarca, Columbia*.

TP337 Additive effects between ingredients on ileal amino acid digestibility in broilers.

V. Ravindran*, *Institute of Food, Nutrition and Human Health, Massey University, Palmerston North, New Zealand*.

TP338 Effect of shochu distillery by-product on skeletal muscle growth in broiler chickens.

T. Kamizono*, T. Tagoyama, A. Ohtsuka, and K. Hayashi, *Kagoshima University, Kagoshima, Japan*.

TP339 The effect of different levels of vitamin E on humeral immunity, and performance in broiler.

R. Vakili*¹ and R. Daliri¹, ¹*Islamic Azad University, khashmar, Iran*, ²*Islamic Azad University, khashmar, Iran*.

TP340 Effects of dietary astaxanthin on gizzard ulceration induced by dietary histamine in broiler chicks.

M. H. Oh*¹, C. S. Song², and K. M. Chee¹, ¹*College of Life Sciences and Biotechnology, Korea University, Seoul, Korea*, ²*College of Veterinary Science, Konkuk University, Seoul, Korea*.

TP341 Influence of main cereal of the diet and feed form on growth performance and digestive traits of brown pullets from 1 to 120 days of age.

M. Frikha^{1,2}, H. M. Safaa^{2,3}, D. G. Valencia², M. P. Serrano², and G. G. Mateos*², ¹*Instituto Agronómico Mediterráneo de Zaragoza, Spain*, ²*Universidad Politécnica de Madrid, Spain*, ³*Animal Production Department, Faculty of Agriculture, Cairo University, Egypt*.

TP342 Effects of pure isomers of conjugated linoleic acid (CLA) on egg quality of laying hens.

E. Muma*¹, E. Valkonen², M. Näsi¹, M. Griinari¹, and J. Valaja², ¹*University of Helsinki, Helsinki, Finland*, ²*MTT Agrifood Research Finland, Jokioinen, Finland*.

TP343 Growth performance of broiler chickens fed diets containing shea nut (*Vitellaria paradoxa*, Gaertn.) meal fermented with *Aspergillus niger*.

H. K. Dei*¹, S. P. Rose², A. M. Mackenzie², and R. Amarowicz³, ¹*University for Development Studies, Tamale, Ghana*, ²*Harper Adams University College, Newport, UK*, ³*Institute of Animal Reproduction and Food Research of the Polish Academy of Sciences, Olsztyn, Poland*.

TP344 Essential oils can substitute growth promoter antibiotics in broiler chicken.

N. Mathlouthi^{1,4}, T. Bouzaïenne², I. Oueslati⁴, F. Recoquillay*³, M. Hamdi², and R. Bergaoui⁴, ¹*Ecole Supérieure d'Agriculture du Kef, Le Kef, Tunisia*, ²*Institut National des Sciences Appliquées et de Technologie de Tunis, Tunis, Tunisia*, ³*Phytosynthèse, Riom, France*, ⁴*Institut National Agronomique de Tunisie, Laboratoire de Recherche en Economie en Agroalimentaire, Tunis, Tunisia*.

TP345 Optimising feed inclusion levels of a multistrain probiotic in broiler nutrition.

K. C. Mountzouris¹, P. Tsirtsikos¹, R. Beltran*², M. Mohnl³, G. Schatzmayr³, and K. Fegeros¹, ¹*Agricultural University of Athens, Department of Animal Nutrition, Athens, Greece*, ²*BIOMIN USA Inc, San Antonio, TX*, ³*BIOMIN GmbH, Herzogenburg, Austria*.

TP346 The potential of Near Infrared Reflectance Spectroscopy (NIRS) to predict nutritional values of the major co-products of the bioethanol industry.

C. Gady, P. Dalibard, and P. A. Geraert*¹, *ADISSEO France SAS, Antony, France*.

TP347 Liquid methionine hydroxy analogue HMTBA has anti fungal activity in *in vitro* tests.

Y. Mercier*¹, M. A. Le Bras-Quere², M. Paugam², and P. A. Geraert¹, ¹*ADISSEO France S.A.S., CERN, Commentry, France*, ²*Université Européenne de Bretagne- Université de Brest, Plouzané, France*.

- TP348 Effects of two mushroom extracts on broiler performance and microbial ecology during coccidiosis.**
L. Mazuranok¹, D. Bravo*¹, H. Panneman², C. Ionescu¹, and M. Naciri³, ¹*Pancosma Research, Geneva, Switzerland*, ²*Dr. Van Haeringen Laboratorium BV, Wageningen, The Netherlands*, ³*INRA, Nouzilly, France*.
- TP349 Nutritional variability of major co-products of the bioethanol industry.**
C. Gady, P. Dalibard, and P. A. Geraert*, *Adisseo France SAS, Antony, France*.
- TP350 Effect of various combinations of carbohydrases for broilers fed corn/SBM-based diets.**
N. E. Ward*¹, J. Wilson¹, S. Williams¹, and G. Mathis², ¹*DSM Nutritional Products Inc., Parsippany, NJ*, ²*Southern Poultry Research, Athens, GA*.
- TP351 Nutritional evaluation of a high protein corn distiller dried grains with solubles (HP corn DDGS) in broilers and evaluation of NSP-enzyme effect on energy digestibility.**
C. Gady, P. Dalibard, and P. A. Geraert*, *Adisseo France SAS, Antony, France*.
- TP352 Nutritional evaluation of corn distiller dried grains with solubles (DDGS) in layers and potential benefit of NSP-enzyme supplementation on energy digestibility.**
C. Gady, P. Dalibard, and P. A. Geraert*, *Adisseo France SAS, Antony, France*.
- TP353 Evaluation of distillers dried grains with solubles (DDGS) in broiler diets formulated isocaloric at typical industry levels or formulated for optimum density with constant 1% poultry oil.**
Z. Wang*, S. Cerrate, C. Coto, F. Yan, F. Perazzo, A. Abdel-Maksoud, and P. Waldroup, *University of Arkansas, Fayetteville*.
- TP354 Effects of five plant extracts on broiler performance during coccidiosis.**
L. Mazuranok¹, B. Bravo*¹, C. Ionescu¹, and M. Naciri², ¹*Pancosma Research, Geneva, Switzerland*, ²*INRA, Nouzilly, France*.
- TP355 Effects of dietary levels of calcium and nonphytate P in broiler starter diets on live performance, bone development, and growth plate conditions in male broilers fed a corn-based diet.**
C. Coto*¹, F. Yan¹, S. Cerrate¹, Z. Wang¹, P. Sacakli¹, P. Waldroup¹, J. Halley², C. Wiernusz², and A. Martinez², ¹*University of Arkansas, Fayetteville*, ²*Cobb-Vantress, Inc., Siloam Springs, AR*.

TP356 Improved nutritional value of feather meal by dietary supplement of versazyme.

J. C. H. Shih*¹, B. E. Spencer¹, and J. J. Wang², ¹*North Carolina State University, Raleigh*, ²*BioResource International*.

TP357 Assessment of the inter-assay repeatability of ileal amino acid digestibility in wheat fed to broilers.

A. Bandegan*¹, W. Guenter¹, D. Hoehler², and C. M. Nyachoti¹, ¹*University of Manitoba, Winnipeg, Canada*, ²*Evonik Industries, Kennesaw, GA*.

TP358 Effects of dietary supplementation of Allzyme SSF® on the performance of chicks fed wheat based diets.

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

TP359 Performance of male broilers fed diets formulated to meet different nutrient recommendations.

F. Yan*, C. Coto, Z. Wang, S. Cerrate, S. Watkins, and P. Waldroup, *University of Arkansas, Fayetteville*.

TP360 Effect of pellet diameter in broiler prestarter diets on subsequent performance.

S. Cerrate*, C. Coto, Z. Wang, F. Yan, and P. W. Waldroup, *University of Arkansas, Fayetteville*.

TP361 Effects of feeding reduced levels of trace mineral proteinates (Bioplex®) to brown layer pullets during development.

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

TP362 Evaluation of various carbohydrase enzymes in broiler chicks.

P. L. Utterback*¹, C. M. Parsons¹, and N. E. Ward², ¹*University of Illinois, Urbana*, ²*DSM Nutritional Products, Parsippany, NJ*.

TP363 Utilization of whole corn germ in broiler chicks feeding.

R. B. Lima¹, C. B.- V. Rabello², J. Ludke³, J. H. V. Da Silva*¹, and D. F. Figueiredo¹, ¹*Universidade Federal da Paraíba, Areia, Paraíba, Brazil*, ²*Universidade Federal Rural de Pernambuco, Recife, Pernambuco, Brazil*, ³*Centro Nacional de Pesquisa de Suínos e Aves, Santa Catarina, Brazil*.

TP364 Comparison of digestible lysine needs in the starter period when fed diets formulated to ideal ratios or added alone.

F. G. P. Costa*², Z. Wang¹, C. Coto¹, S. Cerrate¹, F. Yan¹, and P. W. Waldroup¹, ¹*University of Arkansas, Fayetteville*, ²*Federal University of Paraíba, Areia-PB, Brazil*.

TP365 Evaluation of male broiler performance from 7 to 42 days old feed a diet with hydrolysed feather meal.

M. A. C. Holanda¹, M. C. M. M. Ludke¹, J. V. Ludke⁴, M. C. R. Holanda², J. H. V. Silva*³, A. A. G. Costa¹, and C. B. V. Rabello¹,
¹UFRPE, Recife, Pernambuco, Brasil, ²UAG, Garanhuns, Pernambuco, Brasil, ³UFPA, Pará, Pará, Brasil, ⁴Embrapa Suínos e Aves, Concórdia, Santa Catarina, Brasil.

TP366 The effects of a phytogetic feed additive versus an antibiotic feed additive on oxidative stress in broiler chicks and electron spin resonance.

T. Settle*¹, J. Moritz², S. Leonard³, E. Falkenstein⁴, and H. Klandorf⁵,
¹West Virginia University, Morgantown, ²West Virginia University, Morgantown, ³National Institute of Occupational Safety and Health and Centers for Disease Control, Morgantown, West Virginia, ⁴West Virginia University, Morgantown, ⁵West Virginia University, Morgantown.

TP367 Age effect on nutrient digestibility of corn byproducts determined in broiler chickens.

R. B. Lima¹, C. B-V. Rabello², J. Ludke³, J. H. V. Da Silva*¹, and D. F. Figueiredo¹, ¹Universidade Federal da Paraíba, Paraíba, Brazil, ²Universidade Federal Rural de Pernambuco, Pernambuco, Brazil, ³Centro Nacional de Pesquisa de Suínos e Aves, Santa Catarina, Brazil.

TP368 Evaluation of a fine-limestone, low-energy molt program.

E. Donahue*¹, A. Johnson¹, G. Brant¹, C. Stahl², and K. Bregendahl¹,
¹Iowa State University, Ames, ²North Carolina State University, Raleigh.

TP369 Maximum dietary content of corn distiller's dried grains with solubles for laying hens: Nitrogen balance and egg production.

S. Roberts*¹, L. Pineda², B. Kerr³, and K. Bregendahl¹, ¹Iowa State University, Ames, ²Wageningen University, The Netherlands, ³USDA/ARS, Ames, IA.

TP370 Level of calcium supply and the size of limestone in the morning and afternoon for laying hens.

J. H. V. Da Silva*, J. A. De Araújo, J. M. B. De Sousa, C. C. Goulart, and F. G. P. Costa, *Universidade Federal da Paraíba, Paraíba, Brazil.*

TP371 Evaluation of chick quality as affected by parental diet.

C. S. S. Araujo*¹, L. F. Araujo^{1,2}, M. T. Kidd¹, S. Hubbard¹, D. Everett¹, and C. McDaniel¹, ¹Mississippi State University, Starkville, ²Universidade de Sao Paulo, Pirassununga, SP, Brazil.

TP372 Determination of apparent metabolizable energy of plant based ingredients for turkeys.

B. Jayaraman*¹, J. L. MacIsaac², and D. M. Anderson¹, ¹*Nova Scotia Agricultural College, Truro, NS, Canada*, ²*Atlantic Poultry Research Institute, Truro, NS, Canada*.

TP373 Effect of broilers breeder nutrition on progeny bone density.

C. S. S. Araujo*¹, L. F. Araujo^{1,2}, M. J. Q. Louzada³, M. K. Kidd¹, A. Corzo¹, and J. Benoit¹, ¹*Mississippi University State, Starkville*, ²*Universidade de Sao Paulo, Pirassununga, SP, Brazil*, ³*Universidade Estadual Paulista, Aracatuba, SP, Brazil*.

TP374 Influence of different dietary copper sources on egg shell quality, efficacy of phytase and phosphorus retention in laying hens.

A. Y. Pekel*, G. Demirel, M. Alp, and N. Kocabagli, *Istanbul University, Istanbul, Turkey*.

TP375 Phytase supplementation in laying hens fed different levels of dietary zinc.

D. Saviotto*¹, L. F. Araujo^{1,3}, C. S. S. Araujo¹, O. M. Junqueira², L.C.G.S. Garibaldi¹, and G. A. Gomes⁴, ¹*Universidade de Sao Paulo, Pirassununga, SP, Brazil*, ²*Universidade Estadual Paulista, Jaboticabal, SP, Brazil*, ³*Mississippi State University, Starkville, MS*, ⁴*Globoaves, Toledo, PR, Brazil*.

TP376 Levels of available phosphorus and phytase units in diet of broiler chicks from 22 to 42 days of age.

J. H. V. Da Silva*, J. Jordão Filho, M. L. G. Ribeiro, F. G. P. Costa, and J. A. De Araújo, *Universidade Federal da Paraíba, Paraíba, Brazil*.

TP377 Bone characteristics in laying hens fed different levels of dietary zinc and phytase.

L. C. G. S. Garibaldi*¹, L. F. Araujo^{1,3}, C. S. S. Araujo³, M. J. Q. Louzada², and D. Saviotto¹, ¹*Universidade de Sao Paulo, Pirassununga, SP, Brazil*, ²*Universidade Estadual Paulista, Aracatuba, SP, Brazil*, ³*Mississippi State University, Starkville*.

TP378 Phase-feeding in a small-bird production scenario: Impact on growth and uniformity.

V. B. Brewer*, C. M. Owens, and J. L. Emmert, *University of Arkansas, Fayetteville*.

TP379 Effects of replacing the antibiotic growth promoter by whole cells or cell wall components from *Saccharomyces cerevisiae* in the diet of broiler chickens.

M. L. Angeles¹, S. Gomez*¹, E. Ramirez¹, X. Pastrana², and M. J. Guerrero², ¹*CENIDFyMA - INIFAP, Ajuchitlán, Queretaro, Mexico*, ²*EMVZ - Autonomous University of Queretaro, Queretaro, Mexico*.

TP380 Maternal dietary conjugated linoleic acid (CLA) in a low-fat laying hen diet delays embryonic lipid assimilation and growth during late incubation.

V. A. Leone*, S. P. Worzalla, A. J. Murdoch, and M. E. Cook,
University of Wisconsin, Madison.

TP381 Effect of selenium supplementation on egg production of broiler breeder hens.

A. H. Cantor*, A. J. Pescatore, J. L. Pierce, M. J. Ford, T. Ao, W. D. King, H. D. Gillespie, M. A. Stovall, and L. M. Macalintal, *Alltech/University of Kentucky Nutrition Research Alliance, Lexington.*

TP382 The effect of dietary protein level and digestibility and *Clostridium perfringens* infection on the growth performance of broiler chickens.

G. P. Widyaratne*, A. . Van Kessel, and M. D. Drew, *University of Saskatchewan, Saskatoon, SK. Canada.*

TP383 Gene expression profiles of laying single comb White Leghorn chickens fed diets containing blood meal.

J. Tyus II*^{1,2}, S. Nahashon¹, N. Adefope¹, D. Wright¹, and T. Payne^{1,2},
¹*Institute of Agricultural and Environmental Research, Tennessee State University, Nashville, TN*, ²*Department of Agricultural Sciences, Tennessee State University, Nashville, TN.*

Processing, Products, and Food Safety - Chair: Marcos X. Sanchez-Plata, Texas A & M University

TP384 Quality and safety characteristics of poultry meat and eggs sold in the state of Kuwait.

S. F. Al-Zenki*, H. M. Al-Mazeedi, S. N. Al-Hooti, T. Al-Atti, and H. F. Alomirah, *Kuwait Institute for Scientific Research, Kuwait City, Kuwait.*

TP385 Impact of genotype on carcass, meat quality, and sensory attributes for turkeys raised with outdoor access.

A. C. Fanatico*¹, J. L. Emmert², J. F. Meullenet², and C. M. Owens²,
¹*National Center for Appropriate Technology, Fayetteville, AR*,
²*University of Arkansas, Fayetteville.*

TP386 Effects of shackle line speed on broiler carcass microbiology and presentation scores.

J. K. Northcutt*¹, W. D. McNeal², and K. D. Ingram³, ¹*Clemson University, Clemson, SC*, ²*Meyn America, LLC, Ball Ground, GA*,
³*USDA-ARS, Athens, GA.*

TP387 Effect of sponges and gas-charged incubators on recovery of *Campylobacter* from broiler rinses.

J. E. Line*, *USDA, ARS, Athens, GA.*

TP388 The effect of edible coatings on shell egg quality under refrigerated conditions.

A. Biladeau and K. Keener*, *Purdue University, West Lafayette, IN.*

TP389 Evaluation of bioluminescent bacteria (*Vibrio fischeri*) for detection of antibiotic residues and novel antimicrobial compounds.

J. K. Hargis*¹, A. D. Wolfenden², M. J. Morgan², and G. Tellez²,
¹Fayetteville High School, Fayetteville, AR, ²University of Arkansas, Fayetteville.

TP390 The effect of edible coatings on shell egg functionality under refrigerated conditions.

A. Biladeau and K. Keener*, *Purdue University, West Lafayette, IN.*

TP391 Using automated rep-PCR to determine the genotypic relatedness of *Salmonella* isolates recovered from an integrated broiler operation.

P. N. Anderson*¹, J. A. Byrd^{1,2}, M. E. Hume^{1,2}, K. Stringfellow¹, C. Hernandez¹, and D. J. Caldwell¹, ¹Texas A&M University, College Station, ²USDA-ARS, Food and Feed Safety Research Unit, College Station, TX.

TP392 The microbial and quality properties of poultry carcasses treated with peracetic acid as an antimicrobial treatment.

L. J. Bauermeister*, J. W. J. Bowers, J. C. Townsend, and S. R. McKee, *Auburn University, Auburn, AL.*

TP393 Control of *Listeria monocytogenes* on further processed turkey deli loaves using organic acids as post-cook dips.

J. Johnson*¹, C. Z. Alvarado¹, M. Berrang², S. R. McKee³, L. D. Thompson¹, and M. M. Brashears¹, ¹Texas Tech University, Lubbock, ²USDA-ARS, Athens, GA, ³Auburn University, Auburn, AL.

TP394 Multihurdle approach to controlling *Listeria monocytogenes* in further processed turkey deli loaves.

T. Lloyd*¹, C. Z. Alvarado¹, M. Berrang², S. R. McKee³, L. D. Thompson¹, and M. M. Brashears¹, ¹Texas Tech University, Lubbock, ²USDA ARS, Athens, GA, ³Auburn University, Auburn, AL.

TP395 Will intake of eggs/egg products have benefits for hypertension management?

J. Wu* and K. Majumder, *University of Alberta, Edmonton, AB, Canada.*

TP396 Evaluation of co-incubation of oxygen-dependent bioluminescent *Vibrio fischeri* in sealed plates to support growth of selected anaerobic bacterial isolates.

H. E. Jackson*, M. J. Morgan, and B. M. Hargis, *University of Arkansas, Fayetteville.*

TP397 Prophylactic supplementation of caprylic acid in feed reduces *Salmonella* Enteritidis colonization in commercial broiler chicks.

K. J. Anup*¹, A. B. Sangeetha¹, S. C. Anu¹, M. A. R. Amalaradjou¹, M. J. Darre¹, M. A. Khan¹, T. A. Hoagland¹, D. T. Schreiber¹, A. M. Donoghue², D. J. Donoghue³, and K. Venkitanarayanan¹, ¹*University of Connecticut, Storrs*, ²*PPPSRU, ARS, USDA, Fayetteville, AR*, ³*University of Arkansas, Fayetteville*.

TP398 Texture of frankfurters manufactured from chicken thigh and enriched with plant-based fat sources.

R. Currie*², K. Doncaster¹, and B. Rathgeber¹, ¹*Agriculture & Agri-Food Canada, Kentville, NS, Canada*, ²*Nova Scotia Agricultural College, Truro, Canada*.

TP399 Efficiency of manufacturer recommended microwave time on the recovery Of *Listeria monocytogenes* from inoculated ready-to-eat chicken products.

A. Morey*, M. Singh, and S. R. McKee, *Department of Poultry Science, Auburn University, Auburn, AL*.

TP400 Fatty acids stability in enriched broiler meat during cooking.

T. I. Perez*², M. Betti², M. J. Zuidhof¹, R. Renema², and Y. Ren², ¹*Agriculture Research Division, Alberta Agriculture and Food, Edmonton, AB, Canada*, ²*Department of Agricultural, Food and Nutritional Science, University of Alberta, Edmonton, AB, Canada*.

TP401 Stability of omega-3 PUFAs in enriched eggs fortified with antioxidants following storage and cooking.

Y. Ren*¹, J. Wu¹, R. A. Renema¹, M. Betti¹, M. J. Zuidhof², and T. I. Perez¹, ¹*University of Alberta, Edmonton, AB, Canada*, ²*Alberta Agriculture and Food, Edmonton, AB, Canada*.

TP402 Consumer acceptance of interior egg spots before and after introducing the idea that the spots may merely be shell pigment.

N. P. Johnston*¹, L. K. Jefferies¹, O. A. Pike¹, and B. Rodriguez², ¹*Brigham Young University, Provo, UT*, ²*University of San Andres, La Paz, Bolivia*.

Extension and Instruction -

**Chair: Kenneth MacKlin, Auburn University,
and Jason Lee, Texas A & M University**

TP403 The national poultry waste management symposium as a forum for discussion on poultry waste management issues.

J. B. Hess*¹, J. P. Blake¹, and R. D. Reynnells², ¹*Auburn University, Auburn, AL*, ²*USDA, CSREES, Washington, DC*.

TP404 **Avian crime scene investigation (CSI).**

G. P. Birrenkott* and R. S. Bernard, *Clemson University, Clemson, SC.*

Pathology - Chair: Shayan Sharif, University of Guelph

TP405 **Evaluation of the effectiveness of different levels of nanosilver on bursa of fabricius development and on its histopathological lesions in broiler chicks.**

M. A. Akrami Moghaddam*, A. N. D Jeddi, and F. Ahmadi, *Azad University of Sanandaj, Sanandaj, Kordestan, Iran.*

TP406 **Effects of feed borne *Fusarium* mycotoxins on intestinal morphology in broiler breeder pullets in the absence or presence of a mixed coccidial infection.**

G. N. A. Girgis*, T. K. Smith, and J. R. Barta, *University of Guelph, Guelph, ON, Canada.*

TP407 **3-O Acetyltransferase confers protection against T-2 toxin in vitro.**

S. L. Perrin, J. Lin, and J. M. Grizzle*, *University of Tennessee, Knoxville.*

TP408 **Case report: Necropsy findings during a phytase research trial in broilers.**

V. Durairaj*^{1,2}, T. O'. Conner-Dennie¹, J. L. Emmert¹, N. C. Rath², and F. D. Clark¹, ¹*University of Arkansas, Fayetteville*, ²*PPPSRU/ARS/USDA, Fayetteville, AR.*

TP409 **Comparison of primary chicken embryo cells for propagation of infectious laryngotracheitis virus (ILT).**

J. Y. Lee*, A. Wooming, and B-W. Kong, *University of Arkansas, Fayetteville.*

Behavior and Well-Being - Chair: Anne Fanatico, National Center for Appropriate Technology

TP410 **Open-field temporal pattern of ambulation in Japanese quail genetically selected for contrasting adrenocortical responsiveness to brief restraint.**

J. M. Kembro¹, D. G. Satterlee*², J. B. Schmidt², M. A. Perillo¹, and R. H. Marin¹, ¹*Universidad Nacional de Córdoba, ICTA and CONICET, Argentina*, ²*Louisiana State University Agricultural Center, Baton Rouge.*

TP411 **Effects of alternatives of molting on bird well-being.**

H. W. Cheng*¹, D. Lay¹, R. Marchant-Forde¹, and E. D. Pajor², ¹*USDA-ARS, West Lafayette, IN*, ²*Purdue University, West Lafayette, IN.*

TP412 Effects of separation of resources on behaviour, physical condition and production of laying hens in furnished cages.

T. Tanaka*, T. Shimmura, T. Azuma, Y. Eguchi, and K. Uetake, *Azabu University, Sagami-hara, Japan.*

TP413 Environmental enrichment and use of passionflower in diets of quails.

J. D. T. Silva*, F. H. Hada, R. H. Marques, R. A. Gravena, V. K. Silva, R. D. Malheiros, and V. M. B. Moraes, *State University of São Paulo, Jaboticabal, São Paulo, Brazil.*

TP414 Effect of the density of conspecifics on runway social reinstatement behavior of male Japanese quail genetically selected for contrasting adrenocortical responsiveness to stress.

D. A. Guzman¹, D. G. Satterlee*², J. B. Schmidt², J. M. Kembro¹, and R. H. Marin¹, ¹*Universidad Nacional Córdoba, ICTA, CONICET, Argentina,* ²*Louisiana State University Agricultural Center, Baton Rouge.*

TP415 Effect of lighting programs during the growing phase on bone mineralization of two strains of egg type chickens at end of lay.

D. A. Wilson*¹, P. Settar², J. Arango², N. P. O' Sullivan², Y. Y. Li¹, Z. Lin¹, and P. Y. Hester¹, ¹*Purdue University, West Lafayette, IN,* ²*Hy-Line International, Dallas Center, IA.*

TP416 Use of artificial turf in colony cage nest boxes for single comb white leghorn hens in mid-lay.

K. Doncaster*¹, A. Schuurmans², and B. Rathgeber¹, ¹*Agriculture & Agri-Food Canada, Kentville, NS, Canada,* ²*Nova Scotia Agricultural College, Truro, Canada.*

Genetics - Chair: Huaijun Zhou, Texas A & M University

TP417 Response surface regression analysis to locate optimal minimum age at sexual maturity based on body weights at weeks 8 and 12 for indigenous chicken in Khorasan province of Iran.

H. Farhangfar*, M. E. Navidzadeh, and S. M. Hosseini, *Birjand University, Birjand, Iran.*

TP418 Bayesian estimation of posterior means of heritability for weight at week 8 in Iranian indigenous chickens.

H. Farhangfar*¹, R. Lotfi², M. E. Navidzadeh¹, R. A. Mirzaei³, and A. Shoorideh³, ¹*Birjand University, Birjand, Iran,* ²*Tarbiat Modares University, Tehran, Iran,* ³*Centre of indigenous chicken breeding, Mashhad, Iran.*

TP419 Sequence characterization of K-gene link region of Nagoya breed.

N. Kansaku*¹, M. Kobayashi¹, A. Nakamura², and K. Noda², ¹*Azabu University, Sagamihara, Japan*, ²*Aichi-ken Agricultural Research Center, Aichi, Japan*.

TP420 Variability in embryonic and post embryonic growth in Japanese quail: Effect of egg weight.

B. K. Biswas* and K. L. Arora, *Fort Valley State University, GA*.

SYMPOSIA AND ORAL SESSIONS

Symposium: Future of Poultry Science

Chair: Colin Scanes, University of

Wisconsin-Milwaukee

Strategy 5 & 6

10:15 AM

Welcome and introductory remarks.

Colin Scanes, University of Wisconsin-Milwaukee.

10:25 AM

A historical perspective.

Paul Siegel, Virginia Tech.

10:55 AM

A research perspective - I.

R. L. Taylor, Jr., University of New Hampshire.

11:05 AM

A research perspective - II.

Mary Delany, University of California, Davis.

11:15 AM

A student perspective.

Winners of the student prize.

11:45 AM

An administrative perspective.

Alan Sams, Dean - College of Agriculture, Forestry, and Life Sciences, Clemson University.

12:00 PM

Conclusion.

**World Poultry Science Association Lecture
Chair: Nick Dale, University of Georgia, and
Fred Silversides, Agriculture and
Agri-Food Canada
Great Room C**

1:00 PM

Welcome.

Nick Dale, University of Georgia.

1:10 PM

WPSA Lecture: "The Poultry Scientist: Past, Present, and Future."

Paul B. Siegel, Virginia Tech.

Landmark Papers Symposium

**Chair: Robert L. Taylor Jr., University of New
Hampshire, and Chris Ashwell,
N. C. State University
Great Room C**

7:00 PM

Welcome.

Robert L. Taylor, Jr., University of New Hampshire.

7:05 PM

**Landmark contribution 1. Grumbles, L. C., J. P. Delaplane, and
T. C. Higgins. 1948. Continuous feeding of low concentrations of
sulfaquinoxaline for the control of coccidiosis in poultry. *Poult.
Sci.* 27:605-608.**

Presenter: H. David Chapman, University of Arkansas.

7:25 PM

**Landmark contribution 2. Glick, B., T. S. Chang, and R. G.
Jaap. 1956. The bursa of Fabricius and antibody production.
Poult. Sci. 35:224-225.**

Presenter: Robert L. Taylor, Jr., University of New Hampshire.

7:45 PM

**Landmark contribution 3. van Tienhoven, A., H. C. Thomas
and L. J. Dreesen. 1956. The effect of sulfamethazine feeding on
the thyroids, combs and testes of Single Comb White Leghorn
Cockerels. *Poultry Sci.* 35:179-191.**

Presenter: Wayne J. Kuenzel, University of Arkansas.

8:05 PM

Break.

8:20 PM

Landmark contribution 4. Siegel, P. B. 1962. Selection for body weight at eight weeks of age 1. Short term response and heritabilities. Poultry Sci 41:954-962.

Presenter: Paul B. Siegel, Virginia Polytechnic Institute and State University.

8:40 PM

Landmark contribution 5. Sibbald, I. R., 1976. A bioassay for true metabolizable energy in feedingstuffs. Poultry Sci. 55:303-308.

Presenter: Willam A. Dudley-Cash, Modesto, CA.

9:00 PM

Concluding remarks.

Robert L. Taylor, Jr., University of New Hampshire.

Wednesday, July 23

FASS Workshop on Ag Guide Revision
Chair: Janice C. Swanson, Michigan State
University, and John J. McGlone,
Texas Tech University
Strategy 1

8:00 AM

Background on the revision of the Ag Guide.

8:30 AM

Highlight of major changes in the current revision.

9:00 AM

Roundtable discussion - Topics assigned.

10:00 AM

Conclusions and group summaries.

Behavior and Well-Being
Chair: Anne Fanatico, National Center
for Appropriate Technology
Strategy 5 & 6

8:00 AM 183

Impact of monthly cage sanitation on two to four year old Gallus domesticus laying hens.

K. E. Anderson*, P. E. Mozdziak, and J. N. Petite, *North Carolina State University, Raleigh.*

8:15 AM 184

Effects of feeder space allowance on behavior and productivity of caged hens.

C. M. Thogerson*¹, P. Y. Hester¹, J. A. Mench², R. C. Newberry³, E. A. Pajor¹, and J. P. Garner¹, ¹*Purdue University, West Lafayette, IN*, ²*University of California, Davis*, ³*Washington State University, Pullman.*

8:30 AM 185

Classification of stressful vocalizations of captive laying chickens using the Hidden Markov Model (HMM).

E. Otu-Nyarko*¹, M. J. Darre¹, P. M. Scheifele², D. B. Miller¹, and M. T. Johnson³, ¹*University of Connecticut, Storrs*, ²*University of Cincinnati, Cincinnati, OH*, ³*Marquette University, Milwaukee, WI.*

8:45 AM 186

Effect of amount of human contact on behavioral, physiological and production responses of turkeys.

N. A. Botheras*¹, P. H. Hemsworth², J. M. Engel¹, and M. S. Lilburn¹, ¹*The Ohio State University, Columbus*, ²*University of Melbourne, Victoria, Australia.*

9:00 AM 187

Vocalizations as an indicator of distress in laying hens.

J. L. Canterbury*¹, F. J. Struwe¹, E. Blankenship¹, H. Taira^{1,2}, and M. M. Beck^{1,2}, ¹*University of Nebraska, Lincoln*, ²*Clemson University, Clemson, SC.*

9:15 AM 188

Effects of photoperiod on measures of stress and mobility in growing chickens of three breeds.

R. J. Lien* and J. B. Hess, *Auburn University, Auburn, AL.*

9:30 AM 189

Physiological response of broilers during water based foam depopulation.

M. D. Dawson¹, E. R. Benson*¹, R. L. Alphin¹, G. W. Malone², K. J. Johnson¹, S. E. Seta¹, and D. Hougentogler¹, ¹*University of Delaware, Newark*, ²*University of Delaware, Georgetown.*

9:45 AM 190

Simulation of cold temperature transportation of broiler chickens.

T. L. V. Leer*, N. A. Burlinguetto, S. Dadgar, E. S. Lee, T. D. Knezacek, T. G. Crowe, P. J. Shand, and H. L. Classen, *University of Saskatchewan, Saskatoon, SK, Canada.*

10:00 AM 191

Photoperiod effects on broiler behavior.

A. J. Brown*¹, A. B. Webster¹, B. D. Fairchild¹, and R. J. Buhr²,
¹*Department of Poultry Science, University of Georgia, Athens,*
²*Russell Research Center, USDA-ARS, Athens, GA.*

Environment and Management - III
Chair: Brian Fairchild, University of Georgia
Strategy 3

8:00 AM 192

Ammonia concentrations downwind of broiler houses.

B. D. Fairchild*, M. Czarick, J. W. Worley, C. W. Ritz, B. D. Hale, and L. P. Naeher, *University of Georgia, Athens.*

8:15 AM 193

Modeled ammonia plume dissipation from broiler houses.

L. A. Harper*¹, C. W. Ritz¹, B. D. Fairchild¹, T. K. Flesch², M. Czarick¹, J. W. Worley¹, L. P. Naeher¹, and B. D. Hale¹, ¹*University of Georgia, Athens,* ²*University of Alberta, Edmonton, AB, Canada.*

8:30 AM 194

The potential of vegetative buffers to reduce dust, ammonia, and virus transmission from commercial poultry farms.

H. K. Burley*, P. H. Patterson, R. M. Hulet, H. Lu, A. Adrizal, R. M. Bates, G. P. Martin, C. A. B. Meyers, and H. M. Atkins, *Pennsylvania State University, University Park.*

8:45 AM 195

Varying dietary protein level during rearing affects broiler pullet growth and development.

A. Pishnamazi*¹, R. Renema¹, F. Robinson¹, and M. Zuidhof²,
¹*University of Alberta, Edmonton, AB, Canada,* ²*Alberta Agriculture and Food, Edmonton, AB, Canada.*

9:00 AM 196

Dietary acids for laying hens: Performance, and egg and environmental parameters.

P. H. Patterson*, T. L. Cravener, E. F. Wheeler, and P. A. Topper, *Pennsylvania State University, University Park.*

9:15 AM 197

Controlling post-molt body weight and egg weight with reduced crude protein and lower metabolizable energy.

P. L. Ruzler*¹ and C. L. Novak², ¹*Virginia Polytechnic Institute and State University, Blacksburg*, ²*Land O'Lakes Purina Feed, Kansas City, MO.*

Metabolism and Nutrition - V: Enzymes
Chair: Stephanie Frankenbach, JBS United
Strategy 2

8:00 AM 198

Phytase supplementation of canola meal based diets on phosphorus bioavailability and performance of broiler chicks.

J. I. Sultan*¹, S. Khalil¹, A. Javed¹, M. Yaqoob¹, and M. Yousaf¹,
¹*Institute of Animal Nutrition and Feed Technology, University of Agriculture, Faisalabad, Pakistan*, ²*Department of Livestock Management, University of Agriculture, Faisalabad, Pakistan*,
³*Department of Poultry Science, University of Agriculture, Faisalabad, Pakistan, Faisalabad, Pakistan.*

8:15 AM 199

The effect of phytase, protease and carbohydrase on ileal amino acid digestibility of corn/soy diets for broilers: Complimentary mode of action?

A. J. Cowieson*, *Danisco Animal Nutrition, Marlborough, Wiltshire, United Kingdom.*

8:30 AM 200

Influence of dietary phytic acid and source of microbial phytase on ileal endogenous amino acid flows in broiler Chickens.

A. J. Cowieson*¹, P. H. Selle³, and V. Ravindran², ¹*Danisco Animal Nutrition, Marlborough, Wiltshire, United Kingdom*, ²*Massey University, Palmerston North, New Zealand*, ³*University of Sydney, Camden, NSW, Australia.*

8:45 AM 201

Comparative broiler performance and phosphorus equivalency of thermostable coated phytases to 2000 FTU/kg feed.

P. W. Plumstead*¹, C. E. Gilbert¹, G. A. Partridge¹, and O. Zimonja²,
¹*Danisco Animal Nutrition, Marlborough, United Kingdom*,
²*Norwegian University of Life Sciences, Aas, Norway.*

9:00 AM 202

Effects of amylase and beta glucanase on the availability of true metabolizable energy and digestibility coefficient of corn in roosters.

J. C. C. Carvalho¹, J. A. G. Brito¹, V. A. Costa¹, A. G. Bertechini¹, F. Piracés², and J. O. B. Sorbara*², ¹*Universidade Federal de Lavras, Lavras, MG, Brazil*, ²*DSM Nutritional Products, São Paulo, SP, Brazil*.

9:15 AM 203

Effect of beta-glucanase and alpha-amylase supplementation either individually or in combination with xylanase for broiler chickens after 21 days of age on performance and production cost.

J. O. B. Sorbara*^{1,2}, A. E. Murakami¹, E. S. Nakage¹, E. M. Massuda¹, R. L. H. Guerra¹, and F. Urganani¹, ¹*Universidade Estadual de Maringá, Maringá, PR, Brazil*, ²*DSM Nutritional Products, São Paulo, SP, Brazil*.

9:30 AM 204

The effect of B-Mannanase (Hemicell Feed Enzyme) and high levels of distillers dried grains on turkey hen performance.

M. E. Jackson*¹, K. R. Stephens¹, and G. F. Mathis², ¹*ChemGen Corp, Gaithersburg, MD*, ²*Southern Poultry Research, Athens, GA*.

9:45 AM 205

The effect of dietary supplementation of Alltech VegPro enzyme on amino acid digestibility in turkeys.

M. S. Lilburn*¹, J. Pierce², and A. E. Sefton², ¹*The Ohio State University/OARDC, Wooster, OH*, ²*Alltech Inc., Lexington, KY*.

10:00 AM

Break.

10:15 AM 206

GalliPro® - same performance in energy-reduced diets for broilers.

I. Knap* and B. T. Lund, *Chr. hansen A/S, Boege Alle, Hoersholm, Denmark*.

10:30 AM 207

Effects of amylase and beta glucanase on the availability of true metabolizable energy and digestibility coefficient of sorghum in roosters.

J. C. C. Carvalho¹, L. S. B. Queiroz¹, H. B. Braga¹, A. G. Bertechini¹, J. Lecznieski², and J. O. B. Sorbara*², ¹*Universidade Federal de Lavras, Lavras, MG, Brazil*, ²*DSM Nutritional Products, São Paulo, SP, Brazil*.

10:45 AM 208

Differences in corn energy with the use of alpha-amylase and beta-glucanase for broilers in various production stages.

J. C. C. Carvalho¹, R. L. Rios¹, E. M. C. Lima¹, A. G. Bertechini¹, F. Piracés², and J. O. B. Sorbara*², ¹*Universidade Federal de Lavras, Lavras, MG, Brazil*, ²*DSM Nutritional Products, São Paulo, SP, Brazil*.

11:00 AM 209

Enzyme complex containing NSP-enzymes and phytase improves the performance of broilers fed corn-based diet.

M. Francesch*¹ and P. A. Geraert², ¹*IRTA-Animal Nutrition, Constanti, Spain*, ²*ADISSEO France SAS, Antony, France*.

11:15 AM 210

Effect of protein and energy levels on core body temperature dynamics and response to heat stress in meat-type chickens.

M. J. Zuidhof*¹, R. A. Renema², D. S. Peters¹, J. Berezowski¹, F. I. L. Hernandez¹, and C. Annett¹, ¹*Alberta Agriculture and Food, Edmonton, AB, Canada*, ²*University of Alberta, Edmonton, AB, Canada*.

11:30 AM 211

Effects of dietary protein and energy on broiler live performance to 36 days.

F. I. L. Hernandez*¹, D. R. Korver², R. A. Renema², and M. J. Zuidhof¹, ¹*Alberta Agriculture and Food, Edmonton, AB, Canada*, ²*Agricultural, Food and Nutritional Science, University of Alberta, Edmonton, AB, Canada*.

11:45 AM 212

Methionine deficiency in chicks reduces hepatic recycling of dehydroascorbic acid and up-regulates renal L-gulonolactone oxidase activity.

D. V. Maurice*, S. F. Lightsey, and J. E. Toler, *Clemson University, Clemson, SC*.

Genetics

Chair: Huaijun Zhou, Texas A & M University Strategy 7

1:00 PM 213

The paternal effect of *Campylobacter jejuni* colonization in broilers.

X. Li¹, C. Swaggerty², M. Kogut², H. Chiang¹, Y. Wang¹, K. Genovese², H. He², N. Stern³, and H. Zhou*¹, ¹*Texas A&M University, College Station*, ²*ARS-USDA, College Station*, ³*ARS-USDA, Athens, GA*.

1:15 PM 214

Differentially-expressed soluble proteins in aortic cells from atherosclerosis-susceptible and resistant pigeons.

S. C. Smith, E. C. Smith, M. L. Gilman, J. L. Anderson, and R. L. Taylor, Jr.*, *University of New Hampshire, Durham.*

1:30 PM 215

The inheritance of embryonic chick edema and its penetrance in dwarf SCWL chickens.

W. A. Given, T. F. Savage*, and J. C. Hermes, *Oregon State University, Corvallis.*

1:45 PM 216

Genetic variations in immune-related genes in free-run and free-range chicken flocks.

F Izadi*¹, S. J. Lamont², M. G. Kaiser², and K. M. Cheng¹,
¹*Department of Animal Science, University of British Columbia, Vancouver, BC, Canada,* ²*Department of Animal Science, Iowa State University, Ames.*

2:00 PM 217

The inheritance of clubbed down in Coturnix embryos and its associated genotype-environment interaction.

M. A. Charbonneau, T. F. Savage*, and J. C. Hermes, *Oregon State University, Corvallis.*

2:15 PM 218

Association of FMO3 gene with egg production and quality traits in brown layers.

P. Settar*, J.E. Fulton, J. Arango, J.A. Arthur, and N.P. O'Sullivan, *Hy-Line International, Dallas Center, IA.*

2:30 PM 219

A new cytogenetic model for the order of the nucleolus organizer region (NOR), major histocompatibility complex (MHC) -B, and -Y on microchromosome 16 in chicken.

M. E. Delany*¹, C. M. Robinson¹, R. Goto², and M. A. Miller²,
¹*University of California, Davis,* ²*City of Hope Beckman Research Institute, Duarte, CA.*

2:45 PM 220

DNA based test for the identification of fishy taint in chickens.

J .E. Fulton*¹ and D. E. Harry^{2,3}, ¹*Hy-Line International, Dallas Center, IA,* ²*Oregon State University, Corvallis,* ³*Genetic Foundations, Philomath, OR.*

3:00 PM

Break.

3:15 PM 221

A diallele cross to investigate the impact of selection age on growth response in Japanese quail.

I. D. Harford*, L. K. Stamps, and N. B. Anthony, *University of Arkansas, Fayetteville.*

3:30 PM 222

Gene expression profiling of host responses to Marek's disease virus: A comparison of genetically-defined resistance and susceptibility.

A. J. Sarson*^{1,2}, P. Parvizi¹, D. Lepp², M. Quinton¹, and S. Sharif¹,
¹*University of Guelph, Guelph, ON, Canada*, ²*Guelph Food Research Centre, Agriculture and Agri-Food Canada, Guelph, ON, Canada.*

3:45 PM 223

Cholesterol levels in divergently selected Japanese quail lines following 35 generations of relaxed selection.

C. B. Stephens*, H. L. Marks, M. P. Lacy, E. H. Foster, and M. M. Compton, *Department of Poultry Science, University of Georgia, Athens.*

Metabolism and Nutrition - VI : Feed Additives
Chair: Audrey McElroy, Virginia Tech
Strategy 2

1:00 PM 224

Cardiac morphology, fatty acid status and eicosanoid production in broiler birds: Effect of maternal Omega-3 fatty acids.

J. Bautista-Ortega, G. Cherian*, and D. E. Goeger, *Oregon State University, Corvallis.*

1:15 PM 225

Improvement in hot (dry) breast meat yield of broiler chickens with dietary AZOMITE®, natural mineral supplement, as shown by statistical meta-analyses of data from 13 contract research trials and 10 integrator field trials.

W. Emerson¹ and D. M. Hooge*², ¹*Peak Minerals-AZOMITE, Inc., Warrensburg, MO*, ²*Hooge Consulting Service, Inc., Eagle Mountain, UT.*

1:30 PM 226

The effects of supplemental guanidino acetic acid as a precursor of creatine in vegetable broiler diets on performance and carcass parameters.

J. Ringel*¹, A. Lemme¹, M. S. Redshaw¹, and K. Damme², ¹*Evonik Degussa GmbH, Hanau, Germany*, ²*Bavarian State Research Center for Agriculture, Kitzingen, Germany.*

1:45 PM 227

Field trial demonstrating the beneficial effect of dietary *Bacillus subtilis* C-3102 spores (CALSPORIN®) on brown shell color scores of eggs from hens on litter in three U.S. commercial flocks producing eggs for the free-range egg market versus pre-trial color fan scores.

D. M. Hooge*¹, N. Otomo², and S. C. Johnson³, ¹*Hooge Consulting Service, Inc., Eagle Mountain, UT*, ²*Calpis Co. Ltd, Tokyo, Japan*, ³*Quality Technology International, Inc., Elgin, IL*.

2:00 PM 228

Effects of *Candida* source yeast (CitriStim®) and *Saccharomyces* source yeast on performance of 21 day old broiler chickens.

H. Yang*, M. Sifri, and T. Radke, *ADM Alliance Nutrition, Inc., Quincy, IL*.

2:15 PM 229

Molecular analysis of microbial community structure in the chicken ileum following organic acid supplementation.

G. Nava¹, M. Attene-Ramos¹, H. R. Gaskins¹, and J. D. Richards*², ¹*University of Illinois, Urbana-Champaign*, ²*Novus International, Inc., St. Charles, MO*.

2:30 PM 230

Addition of protected sodium butyrate to broiler feed reduced *Salmonella enteritidis* infection in birds.

J. J. Mallo*¹, M. Puyalto¹, M. Locatelli¹, R. Balaña², and C. Rubio², ¹*Norel SA, Madrid, Spain*, ²*Universidad de Leon, Leon, Spain*.

2:45 PM 231

Effects of feeding two mushroom extracts and *Silybum marianum* on performance of broilers subject to necrotic enteritis.

C. Ionescu*¹, D. Bravo¹, M. Lensing², and J. Van der Klis², ¹*Pancosma Research, Geneva, Switzerland*, ²*Schothorst Feed Research, Lelystad, The Netherlands*.

3:00 PM

Break.

3:15 PM 232

Effects of two mushroom extracts on broiler microbial ecology during coccidiosis.

L. Mazuranok¹, D. Bravo*¹, H. Panneman², C. Ionescu¹, and M. Naciri³, ¹*Pancosma Research, Geneva, Switzerland*, ²*Dr. Van Haeringen Laboratorium BV, Wageningen, The Netherlands*, ³*INRA, Nouzilly, France*.

3:30 PM 233

Effects of feeding two mushroom extracts and milk thistle on blood parameters of broilers subject to necrotic enteritis.

C. Ionescu*¹, D. Bravo¹, M. Lensing², J. Van der Klis², T. T Niewold³, and V. Bruggeman³, ¹*Pancosma Research, Geneva, Switzerland*, ²*Schothorst Feed Research, Lelystad, The Netherlands*, ³*Faculty of Bioscience Engineering, Leuven, Belgium*.

3:45 PM 234

Effect of feeding two mushroom extracts, a milk thistle extract and their combinations on the performance of *E. acervulina* and *E. tenella* challenged broilers.

C. Ionescu*¹, D. Bravo¹, L. Mazuranok¹, and M. Naciri², ¹*Pancosma Research, Geneva, Switzerland*, ²*INRA, Nouzilly, France*.

4:00 PM 235

Effect of feeding two mushroom extracts and a milk thistle extract and their combinations on blood parameters of *E. acervulina* and *E. tenella* challenged broilers.

C. Ionescu*¹, D. Bravo¹, L. Mazuranok¹, M. Naciri², T. Niewold³, and V. Bruggeman³, ¹*Pancosma Research, Geneva, Switzerland*, ²*INRA, Nouzilly, France*, ³*Faculty of Bioscience Engineering, Leuven, Belgium*.

4:15 PM 236

Effects of graded levels of melamine in young broiler chicks.

D. R. Ledoux*, K. C. Zavarize, R. A. Murarolli, R. E. Kutz, G. E. Rottinghaus, A. J. Bermudez, and M. Lin, *University of Missouri, Columbia*.

4:30 PM 237

Meta analysis of the effect of a mixture of carvacrol, cinnamaldehyde and capsicum oleoresin in broilers.

D. Bravo* and C. Ionescu, *Pancosma Research, Geneva, Switzerland*.

4:45 PM 238

Effects of dietary inclusion of essential oil blends on broiler performance, carcass characteristics and sensory quality of meat.

H. Schulze¹, P. Plumstead*¹, H. Bento¹, V. Ravindran², and G. Ravindran², ¹*Danisco Animal Nutrition, Marlborough, United Kingdom*, ²*Institute of Food, Nutrition and Human Health, Massey University, Palmerston North, New Zealand*.

5:00 PM 239

Effect of feed restriction on core body temperature dynamics in meat-type chickens.

R. A. Renema*¹, M. J. Zuidhof², D. S. Peters², J. Berezowski², and C. Oullette¹, ¹*Dept. of AFNS, University of Alberta, Edmonton, AB., Canada*, ²*Ag Research, Alberta Agriculture, Edmonton, AB., Canada*.

**Symposium: Use of Multimedia Educational
Tools in Poultry and Egg Processing Initiatives
for Teaching, Extension, and Outreach**
Chair: **Marcos X. Sanchez-Plata,**
Texas A& M University
Strategy 1

1:00 PM

Welcome and introductory comments.

Marcos X. Sanchez-Plata.

1:10 PM 240

**Multi-media educational tool for poultry meat and egg
processing instruction.**

J. L. Emmert*¹, C. M. Owens¹, C. Z. Alvarado², S. R. McKee³, and
S. F. Bilgili³, ¹*University of Arkansas, Fayetteville*, ²*Texas Tech
University, Lubbock*, ³*Auburn University, Auburn, AL*.

1:40 PM 241

Virtual chicken and other virtual teaching tools.

P. A. Curtis*, *Auburn University, Auburn, AL*.

2:10 PM 242

**Online processing plant tours as teaching tools for food science
and poultry science courses.**

J. M. Regenstein*, *Cornell University, Ithaca, NY*.

2:40 PM 243

**Online and face-to-face classes: A comparative evaluation of
eight large scale introductory food science classes.**

J. R. Rupnow*, J. King, and D. Bentz, *University of Nebraska,
Lincoln*.

3:10 PM

Break.

3:25 PM 244

**iPod technology in graduate agricultural courses: A comparison
of adopters and non-adopters.**

C. Z. Alvarado*, M. T. Brashears, and K. K. Fritz, *Texas Tech
University, Lubbock*.

3:55 PM 245

**Bi-lingual modules for online education in poultry processing,
further processing and food safety in the U.S. and Latin
America.**

M. X. Sánchez-Plata*, *Department of Poultry Science, Texas A&M
University, College Station*.

4:25 PM

Open Discussion.

Symposium: PSE Syndrome in Poultry
Chair: D. P. Smith, USDA/ARS, Athens, GA
Strategy 3

1:15 PM

Welcome and Introductory Remarks.

Chair: Julie Northcutt, Clemson University.

1:30 PM

PSE Background.

Gale Strasburg, Michigan State University.

2:00 PM

North American perspective: Broiler research.

2:00 PM 246

Potential ways to manage PSE poultry meat at the processing plant.

S. Barbut*, *University of Guelph, Guelph, ON, Canada.*

2:20 PM

North American perspective: Turkey research.

2:20 PM 247

Research developments in pale, soft, exudative turkey meat in North America.

C. Z. Alvarado*¹ and C. M. Owens², ¹*Texas Tech University, Lubbock*, ²*University of Arkansas, Fayetteville.*

2:40 PM

North American perspective: Industry.

2:40 PM

“Observations from a primary broiler breeder”.

Danny Lubritz, Cobb-Vantress.

3:00 PM

European perspective: Research.

3:00 PM 248

PSE conditions in poultry: The European perspective.

M. Petracci* and M. Bianchi, *Alma Mater Studiorum - University of Bologna, Department of Food Science, Cesena, Italy.*

3:20 PM

European perspective: Industry.

3:20 PM

“Observations from a primary turkey breeder”.

Joanne Gatcliffe, British United Turkeys.

3:40 PM

Panel Discussion.

OTHER EVENTS

PSA Awards Banquet

Great Room B & C

6:00 PM - 10:00 PM

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American Feed Industry Association

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National Chicken Council Broiler Research Award

G. M. Pesti, Chair (2009)
R. E. Buresh (2010)
A. L. Cartwright (2011)
D. E. Conner (2012)
S. Pretanik, National Chicken Council Representative
M. T. Kidd, Board Liaison

National Turkey Federation Research Award (even years)

M. S. Lilburn, Chair (2008)
M. Sifri (2008)
V. Christensen (2010)
S. Noll (2010)
M. Rybolt, NTF Representative
T. J. Applegate, Board Liaison

Nominating Committee

A. F. Giesen, Chair (Past President, 2011)
S. F. Bilgili (Past President, 2010)
P. Y. Hester (Past President, 2009)
D. Korver (Elected, 2008)
R. E. Buresh (Elected, 2009)
A. P. McElroy (Elected, 2010)

Planning Committee for Annual Meeting

M. Bakst (2007)
M. A. Qureshi (2008)
J. Emmert (2009), Chair
C. Ashwell (2010)
A. F. Giesen (*ex officio*)
N. G. Zimmermann (*ex officio*)

PSA 2008 Centennial Subcommittee

F. E. Robinson, Chair
J. Wilson
J. Summers
R. Austic
N. G. Zimmermann
L. Arrington
M. M. Beck
P. Aho
G. Havenstein
C. Alvarado, Board Liaison

PSA Early Achievement Awards

P. A. Curtis, Chair (2008)
S. J. Lamont (2009)
S. L. Westmoreland (2010)
P. Y. Hester (2011)
M. M. Beck (2012)
T. York (2013)
M. E. Delany, Board Liaison

PSA Hatchery

D. Karcher, Co-Chair
L. Stevenson, Co-Chair
M. O. Smith
A. M. Donoghue
B. M. Hargis
C. Alvarado, Board Liaison

Resolutions Committee

J. C. Hermes, Chair (2008)
G. Cherian (2009)
N. E. Ward (2010)
M. P. Lacy, Board Liaison

Strategic Plan Evaluation Committee (SPEC)

P. Y. Hester, Chair (2006-2008)
M. M. Beck (2008-2010)
M. E. Delany (2006-2008)
V. Carney (2007-2009)
A. J. Pescatore (2008-2010)
R. D. Mitchell (2008-2010)
J. W. Kessler (2006-2010), Board Liaison

Teaching Committee

- Land O'Lakes-Purina Teaching Award

M. T. Kidd, Chair (2008)
J. L. McReynolds (2009)
T. Porter (2010)
W. W. Saylor (2011)
C. Novak, Land O'Lakes/Purina Representative
M. E. Delany, Board Liaison

Tyson Foods Inc. Support Personnel Award

E. Hirschler, Chair (2008)
D. P. Smith (2009)
G. Fasenko (2010)
J. Buhr (2010)
R. D. Reynnells, *ex officio*
R. D. Mitchell, Board Liaison

POULTRY SCIENCE REPRESENTATIVES 2008

American Association for Accreditation of Laboratory Animal Care

K. A. Anderson (2009)

American Association for the Advancement of Science

D. J. Donoghue

American Feed Industry Association

W. A. Dozier, III

American Institute of Biological Sciences

R. Angel

American Poultry Historical Society and Literature Preservation

L. C. Arrington

American Registry of Professional Animal Scientists

D. M. Hooge

Board of Agriculture (National Research Council)

F. A. Bradley

Coalition on Funding Agricultural Research Missions

T. E. Porter

Council for Agriculture Science and Technology

N. G. Zimmermann

International HACCP Alliance

J. H. Denton

James E. Rice Memorial Library

R. E. Austic

Southern Poultry Science Society

R. E. Buresh

World's Poultry Science Association (Canadian Branch)

F. Silversides

NOTES



Poultry Science Association

July 20–23, 2008
Niagara Falls, Canada