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at the

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American Association of Avian Pathologists

2005

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Poster Presenters – VERY IMPORTANT -

Please set up posters in the poster room before 7:30 am Monday, July 18. Posters may be removed beginning Wednesday, July 20 at Noon. The poster viewing session begins at 7:30 each morning. Poster presenters should be available from 7:30 am – 8:00 am each morning and during scheduled breaks in the scientific program to discuss their posters.

SPECIAL PRESENTATIONS

Monday, July 18, 2005

8:00 AM ***Keynote Speaker: Frederic J. Hoerr***

"Clinical Aspects of Immunsuppression"

4:00 PM ***Reed Rumsey Award Presentation: Dhanasekaran Govindarajan***

"Reverse Genetics of Avian Metapneumovirus Subgroup C: Potential for Vaccine Development and Basic Studies"

4:15 PM ***Richard Rimler Memorial Paper: Richard S. Bennett***

"Efficacy Trials of a Novel Avian Metapneumovirus Vaccine"

Tuesday, July 19, 2005

10:00 AM ***Lasher History Lecture: Andrew Rhorer***

" History of the National Poultry Improvement Plan"

2:00 PM ***Session B: Julius Fabricant***

Dedication Lecture "Virus-induced Avian Atherosclerosis: Past and Future"

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Schedule of Events AAAP/AVMA Meeting
Hyatt Regency Minneapolis

Friday, 7/15/2005

7:00 am —5:00 pm	AAAP Board of Directors Meeting - Lake Nokomis

Saturday, 7/16/2005

7:00 am—12:00 pm	AAAP Board of Directors Meeting – Lake Nokomis
1:00 pm—5:00 pm	AAAP Foundation Board Meeting—Lake Nokomis
8:00 am—5:00 pm	Association of Veterinarians in Broiler Production –Lake Superior A
9:00 am—3:00 pm	AAAP Prevention and Control of Avian Influenza in the US CAP Project – Greenway Ballroom G
2:00 pm—7:00 pm	Association of Veterinarians in Turkey Production - Greenway Ballroom D
6:30 pm—10:00 pm	**AAAP - Intervet Reception - Nicollet Ballroom A,B**

Sunday, 7/17/2005

7:00 am—9:00 am	AAAP Animal Welfare Committee - Skyway Suite
7:00 am—8:00 am	AAAP Awards Committee - Lake of the Isles
7:30 am—8:30 am	AAAP Georgia MAM Alumni Association Annual Breakfast - Nicollet A-3
12:00 pm—1:30 pm	AAAP California Poultry Medicine Alumni Luncheon - Lake Calhoun
12:00 pm—1:00 pm	AAAP Committee Chairs Meeting - Greenway Ballroom A
2:45 pm—1:30 pm	AAAP Disease Manual - Editorial Board - Prior Lake
1:30 pm—7:00 pm	AAAP Diseases of Poultry Editorial Committee - Prior Lake
7:00 pm—10:00 pm	North Carolina State University Poultry Health Management Reception & Dinner – Greenway Ballroom F

Monday, 7/18/2005

7:00 am—8:00 am	AAAP Avian Disease Editorial Board - Lake Superior A
7:00 am—8:00 am	AAAP Eskelund Preceptorship Committee - Lake of the Isles
7:00 am—9:00 am	AAAP History Committee - Cedar Lake
7:00 am—9:00 am	AAAP Toxic, Infectious, Miscellaneous, & Emerging Diseases Committee - Skyway Suite A
7:00 am—9:00 am	Associations of Veterinarians in Egg Production - Regency Room
12:00 pm—2:00 pm	**AAAP Awards Luncheon - Nicollet A**
5:00 pm—6:30 pm	AAAP AVMA Liaison Committee - Lake of the Isles
5:00 pm—6:30 pm	AAAP Electronic Information Committee - Lake Calhoun
5:00 pm—6:30 pm	AAAP Enteric Diseases Committee - Lake Nokomis
5:00 pm—7:00 pm	AAAP Isolation & Identification Manual Committee - Cedar Lake
5:00 pm—7:00 pm	AAAP Primary Poultry Breeder Veterinarians Meeting - Lake Minnetonka
6:00 pm—7:00 pm	AAAP Education Committee - Skyway Suite A
6:00 pm—7:00 pm	AAAP Tumor Virus Committee - Lake Superior B
6:30 pm—8:30 pm	AAAP Histopathology/Case Report Interest Group - Greenway Ballroom J

Tuesday, 7/19/2005

7:00 am—8:00 am	AAAP Biotechnology Committee - Greenway Ballroom B,C
10:30 am—12:00 pm	**AAAP Business Meeting—Room A**
12:00 pm—1:00 pm	AAAP Drugs & Therapeutics Committee - Skyway Suite A
12:00 pm—1:00 pm	AAAP Epidemiology Committee - Lake Calhoun
12:00 pm—1:00 pm	Association of Veterinarians in Turkey Production - Greenway D
5:30 pm—7:00 pm	AAAP Respiratory Diseases Committee - Regency Room

Wednesday, 7/20/2005

7:00 am—Noon	AAAP Board of Directors Meeting - Lake Nokomis

	Monday, July 18, 2005 – Morning Program	
	Moderator: Dr. John Glisson	
8:00 AM	**Keynote Speaker: Dr. Frederic J. Hoerr Room A** **"Clinical Aspects of Immunosuppression"**	
	Session A –	**Session B –**
	Moderator: Dr. Linnea Newman	**Moderator: Dr. Jack King**
8:30 AM	**Poultry Genetics, Health and Welfare: Primary Breeding for the Future…** Gustin, Scott J., Leonard W. Fussell, and Roy P. Mutimer	**Recombinant Fowlpox and Inactivated Avian Influenza Vaccines Induced Protection Against Asian H5N1 Highly Pathogenic Avian Influenza in Poultry** Swayne, David E., Joan R. Beck, Michel Bublot, Nikki Pritchard, and Julio Cruz
8:45 AM	**Impact of Genetic Selection Strategies on the Performance, Health and Welfare of Commercial Breeders and Broilers** Rosales, A. Gregorio, Derek Emerson, Barry H. Thorp, and James C. McKay	**Molecular Evolution of H1N1 Influenza Viruses in the US Poultry: Implications for Molecular Diagnostics and Better Vaccine Strain Selection** Jadhao, Samadhan, Dennis Senne, and David L. Suarez
9:00 AM	**The Impact of Seven-day Mortality on Various Components of the Broiler Profit Equation** Tierce, John F., Greg Rennier, and Lloyd Keck	**Protective Effect of DNA Vaccines Encoding Low Pathogenic H9N2 Avian Influenza Virus Genes fused with T-helper Cell Epitope of Newcastle Disease virus in SPF Chickens Challenged with Homologous Avian Influenza Virus** Kwon, Jisun, Hyunjeong Lee, Yongho Hong, and Changseon Song
9:15 AM	**Effects of Temperature and Nutrition of the Neonate on Growth and Performance** S. Lourens and Hill, Donna	**Differentiation of Infected from Vaccinated Animals (DIVA) using Recombinant Fowlpox-H5-Avian-Influenza Vaccine and Existing Serological Tests** Avellaneda, Gloria, Nikki Pritchard, Julio Cruz, Michel Bublot, Joan R. Beck, and David E. Swayne
	Break 9:30 AM – 10:00AM	**Break**
	Moderator: Dr. Linnea Newman	**Moderator: Dr. Jack King**
10:00 AM	**Incubation Effects on Chick Quality** Meijerjof, Ron	**Efficacy of Avian Influenza-Fowl Pox Vaccines, Live Fowl Pox Vector, H7 Subtype, Experimental Products Administered to One-Day-Old SPF Chickens** Cruz-Coy, Julio S., Nikki Pritchard, Joan R. Beck, David E. Swayne, and Michel Bublot
10:15 AM	**Measurement of Stress in Broilers** Stayer, Philip, Thaxton, J. Paul, Martha Ewing, and John Rice	**Role of Antibodies to the Neuraminidase Protein in Protection for Avian influenza** Suarez, David L.
10:30 AM	**Evaluation of Broiler Mobility** Ewing, Martha, John Rice, Philip Stayer, Bruce Webster, and Tim Cummings	**Detection of avian influenza virus by embryo inoculation or PCR** Lucio-Martinez, Benjamin, Sung G. Kim and Susan C. Trock
10:45 AM	**Welfare Aspects of Controlled Atmosphere Stunning** Webster, A. Bruce	**Unusual Characteristics of Highly Pathogenic Avian Influenza Viruses of North American Lineage** Senne, D.A., D.L. Suarez, J.C. Pedersen, and B. Panigraphy
11:00 AM	**Customer Expectations for Animal Welfare** Pfalzgraf, Kellye	**Characterization of Avian Influenza Virus Variants with Different Sizes of the Non-Structural (NS) Genes** Lee, Chang-Won and David L. Suarez
11:15 AM	**Animal Welfare Audits** Ewing, H. Pettit and Robert Thrash	**Characteristics of 2004 Low Path H7N2 Avian Influenza Viruses from the Delmarva Peninsula in Broiler and Leghorn Chickens and Turkeys** Gelb, Jr., Jack, Sandra Cloud, Brian Ladman, Kristi Moore, Conrad Pope, and John Rosenberger
	AAAP Awards Luncheon 11:30 – 2:00 PM	

	Monday, July 18, 2005 – Afternoon Program	
	Session A –	**Session B –**
	Moderator: Dr. Gregorio Rosales	**Moderator: Dr. David Swayne**
2:00 PM	Implementation of Programs to Address Customer Expectations Pfalzgraf, Kellye	**Novel Diagnostic Tests for the Surveillance of Avian Influenza** Lamichhane, Chinta M., Emily Yeh, Eric Deshaies, and Ron Sanders
2:15 PM	**Animal Welfare from a Commercial Layer Production Perspective** Nezworski, Jill	**Investigation of an Outbreak of Avian Influenza Subtype H2N2 in Two Commercial Layer Premises in Pennsylvania (2004)** Henzler, David J. and Huguang Lu
2:30 PM	**Competing Demands for ammonia Management in Poultry Production** Marsh Johnson, Trisha	**Transmission of Low Pathogenicity Avian Influenza Virus (H6N2)** Woolcock, Peter R., Carol J. Cardona, and Jinling Li
	Break 2:45 PM – 3:00PM	**Break 2:45 PM – 3:00PM**
	Moderator: Dr. Gregorio Rosales	**Moderator: Dr. David Swayne**
3:00 PM	**The Difference in Disease Incidence depending on Dead Bird Disposal Methods (Rendering Versus Incinerator)** Valliancourt, Jean-Pierre, David Rives, and Shannon Jennings	**Identification of Key Human Activities and their Role in a Quantitative Risk Assessment Model for Highly Pathogenic Avian Influenza** Vieira, Antonio, Dana Cole, Charles Hofacre, and Lee Myers
3:15 PM	**The Role of Cooperative Extension in an Emergency Poultry Disease Outbreak: A Real Life Experience** Tablante, Nathaniel L. and Lewis E. Carr	**Surveillance and Epidemiology for Avian Influenza in the New York Live Bird Markets** Trock, Susan C., Sung G. Kim, Michelle Gaeta, and Lisa Weisse
3:30 PM	**Interesting Cases from the Poultry Diagnostic Laboratory** Linares, Jose A.	**Use of Multiplex RT-PCR to differentiate Lentogenic NDV from END** Sellers, Holly S., Erich G. Linnemann, and Darrell R. Kapczynski
3:45 PM	**Broiler Breeder Disease Incidence for Alabama, a 10-Year Survey** Van Sambeek, Francene	**Contrasting Results from Molecular and Biological Pathogenicity Assays of Newcastle Disease Virus Isolate Iowa 1519** King, Daniel J., Darrell R. Kapczynski, Claudio L. Afonso, and Andrea Placenti
4:00 PM	**Growth Promoter Antibiotic Feed Additives Impact on Seven Day-Old Broiler Mortality and Early Life Performance** Davis, Stephen W.	**REED RUMSEY AWARD:** **Reverse Genetics of Avian Metapneumovirus Subgroup C: Potential for Vaccine Development and Basic Studies** Govindarajan, Dhanasekaran and Siba K. Samal
4:15 PM	**A Field Investigation of the Total Tissue Arsenic Content of Turkeys Medicated with or without Nitarsone (Histostat®)** Clark, Steven R. and James Skinner	**RICHARD RIMLER MEMORIAL PAPER:** **Efficacy Trials of a Novel Avian Metapneumovirus Vaccine** Bennett, Richard S.
4:30 PM	**Ionophore Myopathy in Chickens** Fitzgerald, Scott D.	**Experimental Infection of SPF Laying Turkeys with Avian Pneumovirus Subtype C: Possible Role of Vertical Transmission** Kapczynski, Darrell R.
4:45 PM	**Assessing the Effect of Light Intensity on the Eyes and Behavior of Broilers** Cummings, Timothy S., Philip A. Stayer, and Marty Ewing	**The Role of Cell Mediated Immunity in Avian Pneumovirus (APV) Infection of Turkeys** Liman, Martin M.R. and Silke Rautenschlein
5:00 PM	**Adjourn**	**Adjourn**

	Tuesday, July 19, 2005 – Morning Program	
	Session A –	**Session B –**
	Moderator: Dr. Tim Cummings	**Moderator: Dr. Margie Lee**
8:00 AM	**Control of Cellulitis in Commercial Turkeys** Karunakaran, Daniel	**A Subunit Vaccine for Controlling *Salmonella enteritidis* in Chickens** Straub, Darren E., Daryll A. Emery, Jim D. Sandstrom, Larry M. Slinden, and Doug T. Burkhardt
8:15 AM	**Effect of Organic Selenium on Broiler Chicken Feathering, Skin Strength, and Cellulitis Prevalence** Boulianne, Martine and Ghislaine Roch	**The Relationship Between Intestinal Persistence and Egg Contamination for Strains of *Salmonella enteritidis* and *S. Heidelberg*** Gast, Richard K., Jean Guard-Bouldin, and Peter S. Holt
8:30 AM	**Brown Discoloration of Processed Broiler Carcasses** Lockaby, Susan B. and Frederic J. Hoerr	**Use of Real-Time PCR for Monitoring Salmonella** Muñoz, R. and P. Tyrrell
8:45 AM	**Attempts to Develop a Predictable Model for Gangrenous Dermatitis in Broilers** Collett, Stephen R., John R. Glisson, Charles L. Hofacre, and Stephan G. Thayer	**Distribution of Fimbrial, Phage and Plasmid Associated Virulence Genes among Poultry *Salmonella enterica* Serovars** Maurer, John J., Rachel Whitaker, Charles L. Hofacre, Margie D. Lee, and Marie Maier
9:00 AM	**Acute Hemorrhagic Enteritis and Necrotizing Hepatitis in Two Day-Old Broilers due to a *Clostridium perfringens* Contaminated Animal Byproduct Feed Ingredient** Davis, Stephen W.	**Development and Evaluation of a Recombinant Strain based on the SefABCD Fimbrial Operon against *Salmonella enterica* Serovar Enteritidis in Chickens** Lopes, Vanessa C., Binu T. Velayudham, Douglas N. Foster, David A. Halvorson, and Kakambi V. Nagaraja
9:15 AM	**Clinical Investigation of a Runting and Stunting Syndrome in Georgia** Zavala, Guillermo, Holly Sellers, and Louise Dufour-Zavala	**Experimental Campylobacter Infection in Immunosuppressed and Normal Broilers** Dhillon, A. Singh, H.L. Shivaprasad, Dennis M. Schaberg, Fonda Wier, Daina V. Bandli, and Sylvia K. Weber
	Break 9:30 AM – 10:00AM	**Break 9:30 AM – 10:00AM**

Lasher History Lecture: 10:00 – 10:30 AM **Room A**

Mr. Andrew Rhorer

"History of the National Poultry Improvement Plan"

AAAP Business Meeting **Room A**
10:30 – 12:00 noon

	Tuesday, July 19, 2005 – Afternoon Program	
	Session A –	**Session B –**
	Moderator: Dr. Stephen W. Davis	**Moderator: Dr. Bruce Stewart-Brown**
1:00 PM	Turkey and Chicken Coccidiosis Control with the Feed Additive Amprolium Mathis, Greg F. and Hector Cervantes	**Novel Clostridia that Colonize the Small Intestine of Young Broilers** Lee, Margie D., Charles L. Hofacre, and Jingrang Lu
1:15 PM	**High Fecal Oocyst Counts of *E. maxima* Associated with Non-Specific Enteritis and Necrotic Enteritis in Broilers** Ruano, Miguel, Bruce Stewart-Brown, Douglas K. Marvil, and Henry M. Engster	**Comparison of Competitive Exclusion Products on the Level of Tetracycline Resistant Coliforms in the Broiler Chicken Environment** Sinclair, Andrea J., Stephen R. Collett, and Margie D. Lee
1:30 PM	**Comparative Pathology of *Eimeria acervulina* and *E. mivati* of the Chicken** Fitz-Coy, Steve H. and Richard Phillips	**Influence of Nitric Oxide Production on Marek's Disease in Broiler Breeder Lines** Schat, Karel A., Priscilla H. O'Connell, Celina Buscaglia, Keith W. Jarosinski, and Igal Pevzner
1:45 PM	**The Pathogenesis and Treatment of *Hexamita meleagridis* Infection in Turkeys** Bermudez, Alex J., Paula Butkeraitis, and Yvette M. Broomhead	**Gene Deletion Mutants of Marek's Disease Virus: The Next Generation of Recombinant Vaccines?** Lee, Lucy F., Robert Silva, Mohammad Heidari, Sanjay Reddy
2:00 PM	**Blackhead Treatment in Broiler Breeder Pullets** Rings, Bret and Travis Glenn	**Virus-induced Avian Atherosclerosis: past and future** Fabricant, Julius
2:15 PM	**Transmission of Blackhead Disease in Chickens** McDougald, L.R., J. Hu, L. Fuller, and P. Armstrong	
	Break 2:30 PM – 3:00PM	**Break 2:45 PM – 3:00PM**
	Moderator: Dr. Greg Mathis	**Moderator: Dr. Ton Schat**
3:00 PM	**Protective Immunity Against *Eimeria acervulina* following in ovo Immunization with a Recombinant Subunit Vaccine and Cytokine Genes** Lillehoj, Hyun S., Xicheng Ding, M.A. Quiroz, E. Berensee, and Rami Dalloul	**Pathotyping of Russian Isolates of Marek's Disease Virus** Dudnikova, E.K., Svetlana N. Norkina, Anatoly N. Vlasov, Anna Y. Slobodchuk, and Richard L. Witter
3:15 PM	**Safety, Efficacy and Performance of a Live Coccidiosis Vaccine** Doelling, Vivan W., Cherilyn L. Heggen-Peay, Greg R. Mathis, Alison Martin, Larry M. Charniga, and Rebecca M. Poston	**Biological Characterization of a Mutant Marek's Disease Virus lacking the UL41 Gene (rMd□UL41)** Gimeno, Isabel M. and Robert F. Silva
3:30 PM	**Comparison of Safety and Efficacy of an *in ovo* Coccidiosis Vaccine Between Different Breeds of Commercial Broilers** Heggen-Peay, Cherilyn L., Rebecca M. Poston, Alison G. Martin, Jim E. Hutchins, Heather E. Boyette, and Vivian W. Doelling	**Comparison of Two Ostensibly Identical Recombinant MHC Haplotypes in Fully Congenic Lines in Their Response to Challenge with vvMD** Wakenell, Patricia, Marcia Miller, and Robert Taylor
3:45 PM	**Chicken Anemia Virus (CAV) Types from Vaccinated and Unvaccinated Commercial Broiler Flocks: Characterization and Comparison** Sommer, Franz, Bruce W. Charlton, and Carol J. Cardona	**Molecular Characterization of the Marek's Disease Virus vhs Gene (UL41)** Silva, Robert F. and Isabel M. Gimeno
4:00 PM	**Transmissible Viral Proventriculitis in North Carolina Broiler Chickens** Monleon, R., Matilde Alfonso, John Radu, James S. Guy, and H. John Barnes	**Functional Characterization of MDV CVI988 Meq Protein using a Retrovirus Expression System** Ajithdoss, Dharani K., Sanjay M. Reddy, and Blanca Lupiani
4:15 PM	**Characterization of a Novel Adenovirus Associated as the Cause of Transmissible Viral Proventriculitis of Broiler Chickens** Guy, James S., John Barnes, and Lynda Smith	**The Physiology of *in ovo* Vaccination** Williams, Christopher J.
4:30 PM	**Evaluation of the Use of a Commercial *Pasteurella multocida* Vaccine administered by the Drinking Water in Broiler Breeder Pullets** Bruzual, Jose J., Andrea Sinclair, John Glisson, and Charles	**Detection of Avian Respiratory RNA Viruses by Multiplex RT-PCR** Lu, Huaguang, Zhigin Xie, and Lin Lin
4:45 PM	**The Interaction Between *E. coli* and Newcastle Disease Virus in Chickens** Eltayeb, Amna B. and Robert P. Hanson	**Disease and Lesions in the Nervous System** Julian, Richard J.
5:00 PM	**Adjourn**	**Adjourn**

	Wednesday, July 20, 2005 – Morning Program	
	Session A –	**Session B –**
8:00 AM	**Plasmids in APEC Virulence and Antimicrobial Resistance: An Overview** Nolan, Lisa K., Timothy J. Johnson, Kylie E. Siek, and Jerod A. Skyberg	**Functional Characterization and Phylogenetic Comparison of the Chicken Toll-like Receptor 7** Kapczynski, Darrell R., Victoria J. Philbin, Adrian L. Smith, and Peter S. Holt
8:15 AM	**Biofilm Formation on Plastic Surfaces by *Escherichia coli* Isolated from Sick and Healthy Poultry** Skyberg, Jerod A., Kylie E. Siek, Curt Koetkott, and Lisa K. Nolan	**Intestine Organ Culture Passaged Infectious Bronchitis Virus Strains: Effect on Specific Pathogen Free Chickens** Alvarado, Ivan, and Pedro Villegas
8:30 AM	**Application of Real Time-PCR in the Diagnosis of Infectious Laryngotracheitis during an Outbreak of the Disease** Oldoni, Ivomar, Sylva Riblet, Kelli Jones, Scott Callison, Guillermo Zavala, and Maricarmen García	**Development of a Lateral-flow Immunoassay for the Detection of IBV Antigen** El-Attrache, John and Jaime Thurk
8:45 AM	**Genotyping Infectious Laryngotracheitis Virus by Multiple Gene Sequencing** García, Maricarmen, Sylva M. Riblet, Ivomar Oldoni, and Shulei Sun	**Efficiency of Recombinant IBV DNA Vaccine in ovo with Interferon Enhancement** Khan, Mazhar I. And Jaroslaw J. Fabis
9:00 AM	**Characterization of a Glycoprotein C Mutant of Infectious laryngotracheitis** Keeler, Jr., Calvin L., William M. Schnitzlein, Andrew E. Shaffer, Deoki N. Tripathy	**Effect of Viremia and Antibody Status on Tumor Incidence, Tumor Spectrum, and Viral Distribution in Different Tissues of ALV-J Infected Meat Type Chickens** Pandiri, Arun Kumar R., Willie M. Reed, and Aly M. Fadly
9:15 AM	**Quantitative Profile of *Mycoplasma gallisepticum* Interaction with the Chicken Tracheal Mucosa in Vaccine Strains and Field Isolates** Levisohn, Sharon, Inna Lysnyansky, Shmuel Perl, and David Yogev	**Evaluation of Response of a New Experimental Line of Chickens (line 0-1) to Avian Leukosis Virus Infection** Mays, Jody K., Henry Hunt, Arun Pandiri, Larry Bacon, and Aly Fadly
	Break 9:30 AM—10:00 AM	**Break 9:30 AM—10:00 AM**
10:00 AM	**The Interference of a Non-Pathogenic Avian Mycoplasma Species with *Mycoplasma gallisepticum* (MG) Infection and Diagnosis** Ferguson, Naola M., Victoria A. Leiting, Ziv Raviv, Ruth S. Wooten, and Stanley H. Kleven	**Comparative Evaluation of the Pathogenicity of an Extraneous Subgroup A Avian Leukosis Virus Isolated from Commercial Marek's Disease Vaccines** Fadly, Aly M., Carolyn A. Davis, Jody K. Mays, and Arun R. Pandiri
10:15 AM	***Case Report: Mycoplasma gallisepticum* Infection in Red and Gold Pheasants** Kelly, Donna J.	**The Emergence of New-type IBD Viruses in the United States and Comparisons to Delaware E in Vaccination/challenge Studies** Cookson, Kalen, Daral Jackwood, and Joe Giambrone
10:30 AM	**Epidemiological Incidence of Field Strains of *Mycoplasma gallisepticum* and *Mycoplasma synoviae* isolated from Broiler Breeders and Breeders in Colombia** Moscoso, Hugo, Jaime A. Ruiz, Ivan R. Alvarado, John R. Glisson, and Charles Hofacre	**Evaluation of the Protection Conferred by Coarse Spray Vaccination against Infectious Bursal Disease in Commercial Broilers** Banda, Alejandro, Pedro Villegas, and Francisco Perozo

	Wednesday, July 20, 2005 – Morning Program	
	Session A –	**Session B –**
10:45 AM	***Mycoplasma synoviae* Control in Multi-Aged Broiler Breeder Farms using Antibiotics Therapy: Case Report** Hong Young-ho, Jisun Kwon, Hyunjeong Lee, and Changseon Song	**Two Bursal, B-cell Subpopulations with Different Flow Cytometry Profiles following IBDV Infection** Petkov, Daniel I., Erich G. Linnemann, Darrell R. Kapczynski, and Holly S. Sellers
11:00 AM	***Mycoplasma gallisepticum* in Commercial Layers** Davison, Sherrill, Stanley H. Kleven, Eric N. Gingerich. Maricarmen García, Perry L. Habecker, and Robert J. Eckroade	**Effect of Infectious Bursal Disease Virus on Macrophages** Sharma, Jagdev M., Mahesh Khatri, Joe M. Palmquist, and Ra Mi Cha
11:15 AM	**Hemagglutinin Serovars of Avibacterium (Haemophilus) paragallinarum: Typing, Cross-protection and Virulence** Soriano V., Edgardo	**In ovo and Post-hatch Vaccination with a Live, Attenuated Variant Infectious Bursal Disease Virus** Kass, Steven A., Mahesh Khatri, Ra Mi Cha, and Jagdev M. Sharma
11:30 AM	**Oligonucleotides Containing CpG Motifs (CpG-ODN) as a Vaccine Adjuvant in Poultry** Gomis, Susantha, Lorne Babiuk, Andrew Potter, and Brenda Allan	**Comparative Pathogenesis of Infectious Bursal Disease Virus (IBDV) Challenge of Chickens after *in ovo* or Post hatch Vaccination** Rautenschlein, Silke and Christine Haase
11:45 AM	**Enhancing DNA Vaccine-Induced Production of Hemagglutinin-Specific Reference Antisera** Pfeiffer, Jennifer and David L. Suarez	**Role of Cellular Signaling Pathways in the Immunopathogenesis of Infectious Bursal Disease Virus** Khatri, Mahesh, Ra Mi Cha, and Jagdev M. Sharma
12:00	**Adjourn**	**Adjourn**

Poster Session
Monday, July 18 – Wednesday, July 20, 2005

Avian Influenza

1. Detection of Antibodies in Serum and Eggs and Virus Shedding in Eggs following Infection with an H6N2 Avian Influenza Virus
   Trampel, Darrell W., En-Min Zhou, and Kyoung-Jin Yoon

2. Variation in the H6 Hemagglutinin Genes of Avian Influenza Viruses Collected from Wild Water-fowl and Shorebirds in North America 1969-2002
   Spackman, Erica

3. Avian Influenza of Subtype H9N2 in Poultry of Lebanon: Immunity and Infection
   Barbour, Elie K., Vatche K. Sagherian, Samar Dankar

4. Microarray Technology for Detection of Avian Influenza
   Maughan, Michele N., Travis W. Bliss, David L. Suarez, and Calvin L. Keeler, Jr.

Bacteria, Miscellaneous

5. An Outbreak of Avian Tuberculosis in Chuckars
   Dhillon, A. Singh, Dennis M. Schaberg, Sylvia K. Weber, Fonda Wier, and Daina V. Bandli

6. Identification of *Bordetella avium* by PCR and Analysis of Amplicon Sequence
   Register, Karen B. and Andrew G. Yersin

7. Efficacy of an Inactivated Pasteurella Vaccine for American Kestrels
   Echo, Jennifer, Patricia Wakenell, and William Ferrier

8. Inflammatory Process in Commercial Broilers related to Skin Scratches Occurring in the Growing Period
   Alfonso, M., Bill Hewat, and H. John Barnes

9. Otitis associated with *Salmonella arizonae* in Turkey Poults
   Shivaprasad, H.L. and P. Cortes

10. Evaluation of Adjuvants and Route of Immunization for *Clostridium perfringens* Type A alpha toxoid Vaccine in Providing Passive Protection against Necrotic enteritis in Broiler chickens
   Dimmick, Suzan, Lindy Echtenkamp, Huchappa Jayappa, Joan Schrader, and Terri Wasmoen

11. *Pasteurella multocida*: Serotypes from Mississippi Isolates
   Magee, Danny L.

12. Use of Subtractive Hybridization to Detect Genomic Differences between Avian Pathogenic and Non-Pathogenic *Escherichia coli*
   Kariyawasam, S. K. Siek, and L. K. Nolan

13. Comparative Genomics and Distribution of an R Plasmid, pAPEC-O2-R, among Avian *Escherichia coli* Isolates
   Johnson, Timothy J., Kylie E. Siek, Sara J. Johnson, and Lisa K. Nolan

General Diseases

14. Spinal Cord Histopathology in Lame Broiler Chickens
    Hoerr, Frederic, Susan Williams, and Scott Westall

15. Microbiological Evaluation of Pekin Duck Baluts
    Fulton, Richard M.

16. Determining the Health Status of Migratory Passerines
    Newcomer, Crystal D., Teresa Y. Morishita, and Paul G. Rodewald

17. Survey of Poultry Disease Knowledge and Nutrition in Backyard Flock Owners
    Martin, Lori, J. David Latshaw, and Teresa Y. Morishita

18. Vascular Lesions in Four-Year-Old Laying Hens
    Fletcher, Oscar J. and John Barnes

19. Systemic Aspergillosis in Broiler Chickens
    Hubbard, Sue Ann

20. Dermal Melanosis in Broiler Chickens
    Crespo, Rocio and Manuel Pizarro

21. Immunohistochemistry in a Case of Mycotoxicosis in Red Partridges
    Crespo, Rocio, Manuel Pizarro, and Maria Castaño

22. Pathology of Older Laying Hens
    Barnes, H. John, Luisa Adochiles, Donna K. Carver, and Gustavo C. Rodriguez

Immunology, Immunity and Vaccines

23. Immunogenicity and Safety of a Novel Avian Herpesvirus Vaccine
    Schrader, Joan S., Stephanie Cook, Gary Petersen, Dianna Jerman, Linda Gergen, and Terri Wasmoen

24. Avian Macrophage Transcriptome Responses to Bacterial Stimuli
    Bliss, Travis W. and Calvin L. Keeler, Jr.

Infectious Bronchitis Virus

25. Anti-virus Functions of Halamine Fabrics: Potential Application for SARS Prevention
    Edwards, Ingrid, Patricia Wakenell, and Gang Sun

26. Longitudinal Field Studies of Avian Respiratory Viruses in Broilers using Type Specific Real-time RT-PCR Assays
    Lee, Hyun-Jeong, Ji-Sun Kown, Ho-Sik Yoon, Yong-Ho Hong, and Chang-Seon Song

27. Serological Reactivity of Baculovirus-expressed Infectious Bronchitis Virus Nucleoprotein
    Vakharia, Vikram N., Chinta Lamichhane, and Gerard E. Edwards

28. Correlation of airsacculitis Condemnation Rates and IBV ELISA and HI Serology Titers in Broiler Flocks from Mississippi
    Senties-Cué, C. Gabriel, Danny L. Magee, and Robert W. Wills

29. Evolutionary Trends in the Group III Avian Coronaviruses
    Jackwood, Mark W. and Deborah A. Hilt

Infectious Bursal Disease

30. Characterization of an Infectious Bursal Disease Virus Isolated from Broilers in Ontario
    Cereno, Teresa N.

31. Comparison of Two Spray Vaccination Methods against Infectious Bursal Disease Virus in Broilers
    Purvis, Linda B., Pedro Villegas, and Alejandro Banda

32. Effect of Fixation Conditions on Immun-histochemistry of IBDV Infected Bursae
    Hamoud, Mohamed M., Pedro Villegas, and Susan M. Williams

33. Efficacy of Two Vaccination Programs Containing 2512 IBDV Strains against Experimental Infection with F25/70 Strain in Broiler Chickens
    Alba Chincha, Mónica, Eliana Icochea, Pablo Reyna, Rosa Gonzalez, and Claudia Perez

34. Study of in ovo Administered Antigen-Antibody Complex Vaccine of IBDV against Challenge F52/70 Strain in Broiler Chickens
    Icochea D'rrigo, Eliana, Mónica Alba, Pablo Reyna, Rosa Gonzalez, Susana Friborg, and Jhon Guzman

Laryngotracheitis

35. Isolation and Molecular Characterization of Virulent Infectious Laryngotracheitis Virus from Commercial Layer Hens in Brazil
    Chacón Villanueva, Jorge Luis, Paulo Eduardo Brandão, Laura Yaneth, Villarreal Buitrago, Antonio Jose Piantino Ferreira

Leukosis

36. Pathogenicity and Transmission of a Field Isolate of Reticuloendotheliosis Virus
    Barbosa, Taylor, Zavala, Guillermo, Sunny Cheng, Maricarmen García, and Susan M. Williams

37. The Genome of Reticuloendotheliosis Virus integrated in the Genome of Fowlpox Virus
    Singh, Pratik, William M. Schnitzlein, and Deoki N. Tripathy

38. Detection of Avian Leukosis Virus Subgroup J from Broilers and Broiler Breeders in Alabama: 1998-2004
    Li, Lanqing, Frederic J. Hoerr, and Michael J. Luther

Miscellaneous Virus

39. Evaluation of Pathogenicity of Avianpox Viruses from Endangered Hawaiian Forest Birds
    Tripathy, Deoki N. and Taejoong Kim

40. Identification of Turkey Astrovirus and Coronavirus Co-infections in Brazil
    Villarreal Buitrago, Laura Yaneth, Mario Sergio Assayag Junior, Paulo Eduardo Brandão, Jorge Luis Chacón Villanueva, Claudete Serrano Astolfi Ferreira, Nelva Grando, Ricardo Soncini, Marcelo Pereira, and Antonio Jose Piantino Ferreira

41. Molecular Characterization of turkey Astroviruses circulating in the United States
    Pantin-Jackwood, Mary J. and Erica Spackman

42. Avian Hepatitis E Virus and Flax as risk factors associated with Hepatitis-splenitis Syndrome in Commercial Laying Hens
    Agunos, Agnes C., Bruce Hunter, Stanley Wayne Martin, Dongwan Yoo, Sameh Youseff, and Brian Binnington

Mycoplasma

43. Status of the ORT, ART, IB, ND, AI (H9N2), MS and MG Infection in Broiler Breeder Flocks in Iran
    Mirsalimi, Seyed Medhi and Omid Rahimzadeh

44. Tissue Responses of SPF Chickens exposed to Live *Mycoplasma gallisepticum* (MG) Vaccines and other MG Strains
    do Nascimento, Elmiro Rosendo, Kelly C Demarque, Rogégio Tortelly, Patricia A. Pólo, Virginia L.A. Pereira, Marcelo A.F. Zuanaze, and M. Graça F. Nascimento

45. Hematological Values on *Mycoplasma synoviae* Experimental Infection
    do Nascimento, Elmiro Rosendo, Rita C.F. Silva, Nadia R.P. Almosny, Virginia L.A. Pereira, Maria L. Barreto

46. Evaluation of DNA Extraction Methods for *Mycoplasma gallisepticum* PCR
    Leiting, Victoria A., Maricarmen García, Naola M. Ferguson, Ziv Raviv, Ruth S. Wooten, Louise Dufour-Zavala, Guillermo Zavala, and Stanley H. Kleven

47. The Effect of *Mycoplasma synoviae* (MS) Challenge at the Onset of Lay on Performance of Table Egg Layers
    Raviv, Ziv and S. H. Kleven

Newcastle

48. Quantification of Newcastle Disease Virus by Real-Time RT-PCR
    Miller, Patti, Daniel J. King, and David L. Suarez

49. Comparison of the Enzyme Linked Immunosorbent Assay and the Hemagglutination Inhibition Test for Antibody to Newcastle Disease in a Commercial Farm and Non-commercial Layers Raised in the Backyard of Poor Families from Argentina
    Buscaglia, Celina, Gabriela Prada, Verónica Prio, Graciela Prio Lofeudo

50. Protection of Chickens from Newcastle Disease with a Recombinant Baculovirus Subunit Vaccine Expressing the Newcastle Disease Virus Fusion and Hemagglutinin-Neuraminidase Protein
    Lee, Youn-Jeong, Haan-Woo Sung, Jun-Gu Choi, Eun-Kyoung Lee, Jae-Hong Kim, Chang-Seon Song

Parasitic Diseases

51. Fecal Oocyst Counts as a Dynamic Tool to Monitor Coccidiosis in Broilers
    Ruano, Miguel, Bruce N. Stewart-Brown, Douglas K. Marvil, and Henry M. Engster

52. Comparative Study of Performance Between Different Anticoccidial Drug Programs and a Vaccine Coccidiosis Control Program
    Quiroz, Marco A., Tim Cherry, Chris D. Knight, Julia J. Dibner, and Steve Mueller

Pneumovirus

53. Optimization of a Diagnostic RT-PCR for Avian Pneumoviruses in Specimens collected on FTA® Cards
    Thayer, Stephan G., Darrell R. Kapczynski, Hugo Moscoso, Gloria Avellaneda, and Charles L. Hofacre

54. Immunopathogenesis of Avian Pneumovirus in Turkeys
    Cha, Ra Mi, Mahesh Khatri, Joe Palmquist, and Jagdev M. Sharma

Toxins

55. The Environmental Fate of Arsenic in 3-Nitro ®
    Shane, Simon M.

56. A Case of Intoxication with Carbamates in Wild Geese
    Bianu, Elisabeta G. and Daniela A. Nica

57. A Case of Acute Intoxication with Arsenic in Poultry
    Nica, Daniela A. and Elisabeta G. Bianu

Session A, Monday, July 18, 2005 **Moderator: Dr. John Glisson**

8:00—8:30 AM **"Clinical Aspects of Immunosuppression"**

Dr. Frederic J. Hoerr, Keynote Speaker

Session A, Monday, July 18, 2005 **Moderator: Dr. Linnea Newman**

8:30—8:45 AM

Poultry Genetics, Health and Welfare: Primary Breeding for the Future

Scott J. Gustin, Cobb-Vantress, Inc.
Co-Authors: Leonard W. Fussell and Roy P. Mutimer

For the primary breeder business, there is continual pressure at the customer level to improve economically important broiler traits without sacrificing breeder performance. However, the genetic growth and feed efficiency potential of these birds demands additional measures to be taken in terms of rearing and managing young breeders. The increasing awareness of animal welfare also places certain demands and restrictions on accepted methods of raising parent-stock breeders. In this presentation we will discuss how Cobb-Vantress, Inc. incorporates the science of immunocompetency, animal welfare, and poultry production in its genetic and management programs for the future.

8:45—9:00 AM

Impact of Genetic Selection Strategies on the Performance, Health and Welfare Of Commercial Breeders and Broilers

A. Gregorio Rosales, Aviagen, Inc.
Co-Authors: Derek Emerson, Barry H. Thorp, and James C. McKay

Today three primary breeding companies supply over 80% of the breeding stock used to produce broiler meat around the world. Genetic selections are carried out in closed pedigree populations. A single pedigree-mating group could give rise to more than 30 million broilers. As a result, selection decisions have a great impact on broiler production, health and welfare. Over recent years significant improvements in health status and resistance to metabolic and skeletal disorders have been made using novel techniques and selection methods while continuing to enhance production efficiency. The impact of evolving selection strategies on future breeder and broiler performance, health and welfare will be discussed.

Session A, Monday, July 18, 2005

9:00—9:15 AM

The Impact of Seven-day-Mortality on Various Components of the Broiler Profit Equation

John F. Tierce, Avian Performance Standards, Inc.
Co-Authors: Greg Rennier and Lloyd Keck

Avian Performance Standards Inc. has been collecting and analyzing broiler performance and production cost data from broiler integrators since 2001. The databases contains information on more than 100 variables which include live costs, processing costs, breeder and broiler vaccination programs, breeder and broiler performance, basic feed ration characteristics, feed additives, breeds and housing practices.

This presentation will summarize data based on 480 million broilers processed during a 24-month period. An analysis designed to examine the impact of seven-day mortality on various components of the broiler profit equation will be presented. Other factors affecting seven-day mortality such as hatchery practices, housing conditions and seasonal effects will also be reviewed.

9:15—9:30 AM

Effects of Temperature and Nutrition of the Neonate on Growth and Performance

S. Lourens, Research Institute for Animal Husbandry
Co-Author: Donna Hill

Environmental temperature and nutrient intake influence first week temperature balance of broiler chicks. A study was conducted to validate the assumption that broiler chicks perform best when rectal temperature during the first week is maintained between 40.0 and 40.5C. When nutrient intake increases metabolism environmental temperature must decreased to maintain temperature balance. For this trial broiler chicks were used that were placed in floor pens within five hours after hatch and chicks that were placed inside the HatchBrood System. The HatchBrood System is hatcher like environment where chicks received water and feed and where rectal temperatures were measured to monitor and control chick temperature in the first week after hatch. The effect of feed and water deprival for two consecutive days is examined in relation to temperature balance and chick performance. Broiler chicks that were kept inside a hatcher environment and that received feed and water for 1, 2 or 7 days before being placed in broiler grow-out facilities developed differently from chicks that were placed immediately after hatch. Results showed improved broiler performance and slaughter yield in chicks that have rectal temperatures between 40.0 and 40.5C for 1, 2 or 7 days. First day temperature control is more important than first day feeding. The HatchBrood System offers opportunities to balance chick temperature between 40.0 and 40.5C by adjusting environmental temperature and nutrient intake and this technique improved overall performance.

BREAK 9:30—10:00 AM

Session A, Monday, July 18, 2005 **Moderator: Dr. Linnea Newman**

10:00—10:15 AM

Incubation Effects on Chick Quality

Ron Meijerhof, Hybro bv., The Netherlands

The incubation process has an enormous influence on development of the embryo, with consequences for bird performance later on. The economical influence of a hatchery on bottom line profits is therefore not so much determined by hatchability or hatch of fertiles, but much more by resulting broiler performance. To understand the influence of this incubation process on the development, we have to look at incubation from an embryo's point of view much more then from a technical point of view. As a result, the design and control of incubators have to be adjusted to optimize this developmental process.

10:15—10:30 AM

Measurement of Stress in Broilers

J. Paul Thaxton, Mississippi State University
Co-Authors: Martha Ewing, John Rice, and Philip Stayer

Welfare concerns of broilers center around production and slaughter methods. Rearing and slaughter conditions that compromise productivity, well being, and behavior of broilers can also evoke stress responses. The ratio of circulating heterophils to lymphocytes (H/L ratio) has been accepted as the best measure of stress in chickens since the 1980's. However, the stress hormone, corticosterone (CS), has recently been shown to be the most sensitive stress indicator in broilers. The present report details efforts to evaluate stress in broilers based on circulating levels of CS. Maximum CS responses occur following infusion of adrenocorticotropin (ACTH) using surgically implanted osmotic pumps. CS levels in broilers reared under various stocking densities, as well as in commercial conditions, were compared. Results indicate that stress, depicted by elevated circulating CS level, does not occur in broilers reared under present day commercial conditions.

Session A, Monday, July 18, 2005

10:30—10:45 AM

Evaluation of Broiler Mobility

Martha Ewing, Sanderson Farms, Inc., Laurel, MS
Co-Authors: John Rice, Philip Stayer, Bruce Webster, and Tim Cummings,

The mobility of broiler chickens was evaluated just prior to marketing to determine a percentage of the chickens with impaired gait. The chickens were divided into two populations, one with an age of approximately 50 days and 6 lbs. live weight, the other approximately 60 days and 8 lbs. live weight. Twenty-five chickens were caught and evaluated at four separate locations in each of 100 houses, to assure an unbiased sample. Chicken gaits were scored as Normal (0), Reluctant (1), and Impaired (2). In the 60 day old group, 95.3% scored “0”, with 4.3% and 0.3%, scoring “1” and “2”, respectively. In the 50 day old group, 98.9% scored “0”, with 0.92% scoring “1” and 0.1% scoring “2”. Overall, very few birds, 0.224%, were found to be non-ambulatory, score “2”. The low occurrence of gait abnormality was not a result of rigorous culling or premature mortality since the cull rate and total mortality averaged 0.91% and 3.11%, for the 60 day old group respectively, and 0.71% and 2.69% for the 50 day old group. Plant condemnation for whole birds and parts was less the 0.5% for both groups. Stocking densities were at industry standards.

10:45—11:00 AM

Welfare Aspects of Controlled Atmosphere Stunning

A. Bruce Webster, The University of Georgia

The current method of electrically stunning poultry prior to slaughter is perceived by many people to be rough and overly detrimental to the welfare status of the birds. Controlled atmosphere stunning (CAS) can eliminate some of the problems associated with electrical stunning. However, the different atmospheres used for CAS also have some negative welfare aspects. The four types of CAS are: Anoxia (usually argon or nitrogen with low residual oxygen); Hypercapnic Anoxia (argon or nitrogen mixed with carbon dioxide); Hypercapnic Hypoxia (carbon dioxide mixed in air); and Hypercapnic Hyperoxygenation. All CAS methods take time to induce insensibility, allowing a bird to perceive noxious stimuli, if any exist. Stunning atmospheres enriched with carbon dioxide can be detected by chickens, which show characteristic head shaking and deep breathing behavior patterns and demonstrate some degree of avoidance. Anoxic atmospheres induce convulsive actions, some of which appear to occur before unconsciousness. The strong convulsive wing flapping that occurs after loss of posture in anoxic atmospheres may be distressing to poultry in groups. Birds vary in time to unconsciousness and in CAS using anoxia in a commercial setting, some birds would see others burst into convulsive wing flapping and even be struck by them before they, themselves, became insensible.

Session A, Monday, July 18, 2005

11:00—11:15 AM

Customer Expectations for Animal Welfare

Kellye Pfalzgraf, Tyson Foods

Animal welfare issues have prompted an increased interest in procedures and practices used to raise and slaughter chickens. Some retail and foodservice companies have developed expectations and audit criteria for their poultry suppliers. The National Chicken Council has developed the Animal Welfare Guidelines and Audit Checklist. The National Chicken Council Food Marketing Institute and National Council of Chain Restaurants have developed an audit for their members use to evaluate animal welfare in the slaughter plants and live production areas of the chicken industry. Some of these requirements will be discussed during this presentation.

Session A, Monday, July 18, 2005

11:15—11:30 AM

Animal Welfare Audits

H. Pettit Ewing, Process Management Consulting, Inc.
Co-Author: Robert Thrash

With the increased awareness on issues such as animal welfare, customers have requested audits, a planned, independent, and documented assessment to determine whether agreed upon requirements (concerning animal welfare) are met. Many of the audit standards have been based on the guidelines developed by the National Chicken Council. Some customers have also developed their own criteria. During the audit, specific observations will be made and measured against a standard. The audit will also assess the written animal welfare programs and the implementation, including documentation, of those programs. It is the auditor's job to know the standards, collect the data, and have the knowledge to accurately compare the producer's practices and procedures with the accepted guidelines or standards.

AAAP AWARDS LUNCHEON
11:30 AM—2:00 PM

Session A, Monday, July 18, 2005 **Moderator: Dr. Gregorio Rosales**

2:00—2:15 PM

Implementation of Programs to Address Customer Expections

Kellye Pflazgraf, Tyson Foods

Written programs and audit schemes will be needed to meet the customer's expectations for animal welfare. Some customers are currently performing audits in the slaughter plants, hatcheries, catching crews and grow-out houses. Current audit criteria and required programs will be discussed along with potential requirements in these areas for the future. Suggestions for implementation of animal welfare procedures will be included.

2:15—2:30 PM

Animal Welfare from a Commercial Layer Production Perspective

Jill Nezworski, Michael Foods

Consumer concerns are driving the poultry industry to change cage density and documentation. On the farm, these changes require new procedures. It is generally thought more room for the birds is better; however, there seems to be a point where more is not better. Smaller populations may prevent the birds from forming a natural grouping. Temperatures throughout the laying house are more difficult to equalize. Flocks will average lower mortality and generally have fewer health problems. Backfilling affects flock population. In the lower density, this influence is very noticeable.

2:30—2:45 PM

Competing Demands for Ammonia Management in Poultry Production

Trisha Marsh Johnson, Jones-Hamilton Co.

In today's regulatory and consumer environment, many demands are placed on poultry producers in regards to managing ammonia. Often, these demands are contradictory to each other and call for conflicting management strategies. This paper will review the current demands for ammonia management in regards to EPA regulations, consumer-based animal welfare programs, and bird health needs. Management and abatement strategies for balancing these needs and the veterinarian's role in oversight ad monitoring will also be discussed.

BREAK 2:45—3:00 PM

Session A, Monday, July 18, 2005 **Moderator: Dr. Gregorio Rosales**

3:00—3:15 PM

The Difference in Disease Incidence depending on Dead Bird Disposal Methods (Rendering Versus Incinerator)

Jean-Pierre Vaillancourt, University of Montreal
Co-Authors: David Rives and Shannon Jennings

Dead birds can be a source of infectious diseases. The risk is believed to be higher when rendering is used to dispose of mortality. It was hypothesized that using incinerators to destroy dead birds on farms would reduce this risk. Production and disease data were obtained from two integrated turkey companies. A total of 3245 flocks were included in this three-year retrospective study. The status of each flock was determined for the presence of turkey coronavirus infection (TCV), mycoplasmosis (MG), and fowl cholera (cholera). Flocks raised on farms without incinerators were about two times more likely to have experienced TCV, MG, or cholera than farms equipped with incinerators ($p<0.01$).

3:15—3:30 PM

The Role of Cooperative Extension in an Emergency Poultry Disease Outbreak: A Real Life Experience

Nathaniel L. Tablante, VA-MD Regional College of Veterinary Medicine
Co-Author: Lewis E. Carr

Historically, land grant universities have been tasked with conducting relevant research and disseminating new technology and information to farmers and producers. Traditionally, campus-based researchers conduct basic research while Extension agents or specialists share the results of that research and apply them in actual field situations. In non-emergency situations, typical Extension programs include conducting workshops and other training programs, development and distribution of fact sheets, newsletters, and other educational materials, on-site demonstrations, and participation in industry committees. In an emergency situation such as an outbreak of Avian Influenza, the role of Cooperative Extension becomes more focused on providing assistance to the Emergency Response Team to control the outbreak. As the authors found out during the 2004 LPAI outbreak on Delmarva, this is easier said than done.

3:30—3:45 PM

Interesting Cases from the Poultry Diagnostic Laboratory

Jose Linares, Texas Veterinary Medical Diagnostic Laboratory

Case histories, gross lesions and diagnoses from various recent interesting cases submitted to the Poultry Diagnostic Laboratory in Gonzales, TX will be presented. The cases will include backyard and commercial poultry, game birds and wild bird submissions. The format could allow interaction with the audience. The intent is to provide a change of pace for our annual meeting with some “old-fashioned” diagnostics. This report may give “younger” poultry veterinarians a chance to see lesions/diseases they may have heard-off but never seen and “older” veterinarians a chance to remember the “good old days”. Please contact me if you need more details.

Session A, Monday, July 18, 2005

3:45—4:00 PM

Broiler Breeder Disease Incidence for Alabama, a 10-Year Survey

Francene Van Sambeek, Alabama Department of Ag and Industry

The case report will summarize the disease incidences in multiplier, commercial, broiler-breeder flocks, which were older than 22 weeks of age, submitted to the Alabama State Diagnostic Labs for mortality and diseases diagnosis. The report will indicate the primary disease diagnosis in the flock. Viral, bacterial, and parasitic diseases will be covered.

4:00—4:15 PM

Growth Promoter Antibiotic Feed Additives Impact On Seven Day-Of-Age Broiler Mortality and Early Life Performance

Stephen W. Davis, Colorado Quality Research, Inc.

Continued consumer and governmental legislation trends toward limiting or prohibiting the use of antibiotics as growth promoters in food animal feeds has created an increased industry practice of raising commercial broilers without feeding these antibiotics. Data from a series of broiler floor-pen studies (over 20 studies) comparing treatments with or without a growth promoting antibiotics will be presented. The studies indicate a consistent and significant decrease in seven day broiler mortality results. Growth promoter antibiotic effects on the cause of mortality, weight gain, and feed conversion will also be discussed.

4:15—4:30 PM

A Field Investigation of the Total Tissue Arsenic Content of Turkeys Medicated with or without Nitarsone (Histostat7)

Steven R. Clark, Alpharma
Co-Author: James Skinner

Selected two flocks, one fed nitarsone (Medicated) and one not (Control), and sampled liver and breast muscle from 5-birds each at similar ages. The Medicated flock was sampled while being medicated with nitarsone (49 days of ages), but just prior to withdrawal from feed, and 11-days later. The Control flock was sampled at 54 and 63 days of age. Under conditions of this trial, it is concluded that arsenic depleted from the liver and muscle tissues of turkeys medicated with nitarsone after withdrawal of the drug for 9-days. Any detectable level after that time would be comparable to birds never treated with nitarsone.

4:30—4:45 PM

Ionophore Myopathy in Chickens

Scott D. Fitzgerald, Michigan State University

Skeletal muscle degeneration has been associated with a variety of conditions in chickens including: hereditary dystrophy, deficiency of vitamin E or Selenium, exertional stress, deep pectoral myopathy, and toxicants including *Cassia occidentalis* and ionophore antibiotics. We report several cases of ionophore myopathy in chickens associated with the feeding of recommended levels of monensin. Histologic findings were most prominent in the thigh and leg muscles and included hyalinization, fragmentation, increased numbers of sarcoplasmic nuclei, and the presence of regenerative myofibers. Ionophore myopathy may result even when using at recommended levels due to improper mixing of the feed, interaction with potentiating antibiotics, or insufficient anti-oxidants within the feed.

4:45—5:00 PM

Asessing the Effect of Light Intensity on the Eyes and Behavior of Broilers

Timothy S. Cummings, Mississippi State University
Co-Authors: Philip A. Stayer and Marty Ewing

This project assessed the effects of low intensity lighting on the welfare of commercial broilers. We looked at broilers on a farm that had a tunnel, dark-out house as well as a conventional, curtain-sided house. The conventional house allowed natural daylight in through transparent curtains whereas the tunnel house utilized a low intensity lighting program. The broilers in both houses were near processing age and of the same breed. We compared intraocular pressures (IOP), eye dimensions, ocular histology, and tonic immobility (TI) time between the two houses. No eye pathology among the two groups was found, but recognized behavioral differences were noted and will be reported.

ADJOURN

Session B, Monday, July 18, 2005 **Moderator: Dr. Jack King**

8:30—8:45 AM

Recombinant Fowlpox and Inactivated Avian Influenza Vaccines Induced Protection Against Asian H5N1 Highly Pathogenic Avian Influenza in Poultry

David E. Swayne, USDA/ARS/Southeast Poultry Research Laboratory
Co-Authors: Joan R. Beck, Michel Bublot, Nikki Pritchard, and Julio Cruz

Since December 2003, H5N1 highly pathogenic avian influenza virus has caused outbreaks of disease in nine Asian countries and affected over 200 million birds. Vaccines can be used as a tool to prevent the disease and reduce field virus replication. This study reports experimental studies with inactivated avian influenza and recombinant fowlpox-H5-avian influenza vaccines for their ability to protect chickens, geese and ducks from disease. The vaccines prevented disease and mortality in chickens, and reduced the ability of the field virus to replicate in gastrointestinal and respiratory tracts. In ducks, the Asian H5N1 HPAI virus did not cause disease or mortality, but the inactivated vaccine reduced field virus replication in the respiratory and intestinal tracts. The inactivated vaccine protected geese from morbidity and mortality.

8:45—9:00 AM

Molecular Evolution of H1N1 Influenza Viruses in the US poultry: Implications for Molecular Diagnostics and Better Vaccine Strain Selection

Samadhan Jadhao, Southeast Poultry Research Laboratory, USDA-ARS
Co-Authors: Dennis Senne, David L. Suarez

Wild birds are natural reservoirs of all known subtypes (H1-H16) of influenza A viruses. H1 and H3 influenza viruses are wide spread in both the human and swine populations, and they can be transmitted between various avian and mammalian species posing concern to animal and public health. In the US, H1N1 influenza viruses are responsible for disease in turkey breeders leading to significant annual economic losses. The aims of this study were (i) to determine the nucleotide sequence of entire genome of twenty five H1N1 influenza viruses that were isolated during 1976-2002 from variety of birds and swine in the US, and (ii) understand molecular evolution of the viruses and utilize the data to update the existing real time RT-PCR diagnostic reagents. Phylogenetic analysis of multiple genes revealed that H1 influenza viruses circulating in the U.S. could be of completely of avian origin, swine origin, or reassortant viruses with human, avian and swine origin influenza genes. Comparison of antigenic relatedness of theses viruses will be examined to determine if a single vaccine strain could potentially provide broad antigenic coverage. Implication of the variations in H1 HA gene sequence of these virus isolates and sequences existing in the public domains are being compared to test the validity and need to update the existing real time RT-PCR diagnostic reagents available in our laboratory. Performance of both existing and updated real time RT-PCR tests for the detection of H1 influenza viruses in clinical specimens obtained from experimental infection of turkey will be discussed.

9:00—9:15 AM

Protective Effect of DNA Vaccines Encoding Low Pathogenic H9N2 Avian Influenza Virus Genes Fused with T-helper Cell Epitope of Newcastle Disease Virus in SPF Chickens challenged with Homologous Avian Influenza Virus.

Jisun Kwon, Konkuk University, Republic of Korea
Co-Authors: Hyunjeong Lee, Yongho Hong, and Changseon Song

To enhance the immune responses of plasmid-expressed antigen, plasmids encoding the H9N2 low pathogenic avian influenza (LPAI) hemagglutinin, neuraminidase and matrix genes fused with T-helper cell epitope of NDV (pCI-p35HA, pCI-p35NA and pCI-p35M, respectively) were constructed. This strategy may activate high level of T-helper cells as well as induce more effective immunity. SPF chickens previously vaccinated with ND live vaccine were intramusculary inoculated with constructed plasmids and challenged with homologous LPAI virus. Protective effects of the constructed DNA vaccines were evaluated based on antibody responses and viral shedding in the trachea and cloaca. The role of NDV T-helper cell epitope in DNA vaccine inoculated birds will be discussed.

9:15—9:30 AM

Differentiation of Infected from Vaccinated Animals (DIVA) using Recombinant Fowlpox-H5-avian-influenza Vaccine and Existing Serological Tests

Gloria Avellaneda, Southeast Poultry Research Lab, USDA, ARS
Co-Authors: Nikki Pritchard, Julio Cruz, Michel Bublot, Joan R. Beck, and David E. Swayne

Recombinant fowl pox vaccine virus containing the H5 hemagglutinin of avian influenza (AI) virus protects chickens and turkeys from clinical signs and death, and reduces respiratory and intestinal replication of an H5 AI challenge virus, but may not fully prevent challenge virus replication. Because of the widespread outbreaks of H5N1 AI in Asia and the use of vaccines, surveillance programs must be developed to differentiate vaccinated from infected birds in order to evaluate the success of vaccination and eradication programs and, continue National and International commerce on poultry and poultry products. In this study, recombinant fowlpox-H5-AIV vaccine was evaluated as a potential vaccine for a DIVA strategy using the existing hemagglutination inhibition (HI) and agar gel immunodiffusion (AGID) tests. In two different trials, birds immunized with the vaccine did not have AGID antibodies because the vaccine lacks AI nucleoprotein. The HI tests were positive between 0 and 100% based on the antigen selected for use. If antigen from the insert, A/turkey/Ireland/83, was used, HI titers were high and consistent while use of A/turkey/Wisconsin/68 failed to detect antibodies in most vaccinated groups. After challenge, chickens had both HI and AGID antibodies. This vaccine allowed easy serological differentiation of vaccinated from infected birds using existing AGID and HI tests.

BREAK 9:30—10:00 AM

Session B, Monday, July 18, 2005 **Moderator: Dr. Jack King**

10:00—10:15 AM

Efficacy of Avian Influenza-Fowl Pox vaccines, Live Fowl Pox Vector, H7 Subtype, Experimental Products, Administered to One-Day-Old SPF Chickens

Julio S. Cruz-Coy, Merial Select, Inc.
Co-Authors: Nikki Pritchard, Joan R. Beck, David E. Swayne, and Michel Bublot

The purpose of the study was to determine whether recombinant Avian Influenza-Fowl Pox Experimental Vaccines, H7 Subtype, were able to protect against the highly pathogenic Avian Influenza challenge, Italian strain (A/chiken/Italy/4580/99-H7N1), following the vaccination of one-day-old SPF chickens by the subcutaneous (SQ) route.

Results indicated that two of the constructs tested provided 90% protection against the Highly Pathogenic Avian Influenza challenge.

Efficacy results, serology (HI titers), and virus recovery after the challenge will be presented.

10:15—10:30 AM

Role of Antibodies to the Neuraminidase Protein in Protection for Avian Influenza

David L. Suarez, Southeast Poultry Research Laboratory, ARS, USDA

Antibodies to the hemagglutinin protein of avian influenza virus are considered to be the most important for providing protection from virulent challenge. However, antibodies to the neuraminidase protein are also thought to be protective, but to a lesser extent. It is unclear if killed vaccines for avian influenza produce effective levels of antibody, which could influence the level of protection. A vaccine trial, using DNA vaccines to elicit antibodies only to the neuraminidase gene, was performed to assess both clinical protection and viral shedding. Several highly pathogenic avian influenza challenges were used to assess how antigenic variation affects protection.

10:30—10:45 AM

Effect of a Novel Anti-oxidant on Avian Influenza Multiplication in Chicken Embryos

Benjamín Lucio-Martínez, Cornell University

A novel anti-oxidant inhibits the replication of avian influenza virus in chicken embryos with no effect on chicken embryo development. Chicken experiments may be available by the time of the presentation at the AAAP meeting .

Session B, Monday, July 18, 2005

10:45—11:00 AM

Unusual Characteristics of Highly Pathogenic Avian Influenza Viruses of North American Lineage

D. A. Senne, National Veterinary Services Laboratories
Co-Authors: D. L. Suarez, J. C. Pedersen and B. Panigrahy

The molecular marker for pathogenicity of H5 and H7 avian influenza viruses has been associated with presence of multiple dibasic amino acids at the cleavage site of the hemagglutinin (HA) protein or for H5 viruses the presence of multiple dibasic amino acids with a loss of glycosylation site near positions 10-12, which is spatially near the HA cleavage site. Historically, all HPAI viruses have one of these characteristics but three recent North American lineage HPAI viruses which caused outbreaks in Chile, the United States, and Canada respectively in 2002, 2004 and 2004, have neither of these characteristics. The uniqueness of these HPAI viruses and implications for regulatory control will be discussed.

11:00—11:15 AM

Characterization of Avian Influenza Virus Variants with Different Sizes of the Non-structural (NS) Genes

Chang-Won Lee, Southeast Poultry Research Lab, USDA-ARS
Co-Author: David L. Suarez

The influenza isolate A/Turkey/OR/71-del has a 10 nucleotide deletion in the coding region of the NS1 and produces a truncated NS1 protein. From this stock of virus, we found that several variants with different sizes of the NS genes exist. One particular variant (Double-deletion (D-del)), with a 185 nucleotide deletion in the NS gene, selectively increased during passage in 10- and 14-day old ECE, but not in 7-day old ECE. Using reverse genetics, we confirmed that the different size of the NS genes could be generated directly from parental (A/Turkey/OR/71-del) NS sequence while the D-del NS gene was genetically stable. Our observation shows unique compensatory adaptation process of the influenza virus with the defective NS gene and further analysis on NS gene variants with different sizes of deletion in different location of NS gene will give more insights on the function of specific parts of the NS gene.

11:15—11:30 AM

Characteristics of 2004 Low Path H7N2 Avian Influenza Viruses from the Delmarva Peninsula in Broiler and Leghorn Chickens, and Turkeys

Jack Gelb, Jr., University of Delaware
Co-Authors: Sandra Cloud, Brian Ladman, Kristi Moore, Conrad Pope, and John Rosenberger

The pathogenicities of four low-path (LP) H7N2 isolates of avian influenza viruses (AIV) were compared. Isolates Delaware/Chicken/Viva/2004, Delaware/Chicken/Hobo/2004, and Maryland/Chicken/Minh Ma/2004\ were from the 2004 AI outbreak on the Delmarva Peninsula. The Pennsylvania/Chicken/1997 H7N2 strain was included for comparison. Viruses were inoculated via eyedrop into 3-week-old broilers, SPF and commercial leghorns and turkeys.

On days 3, 7 and 14-post inoculation, tracheal and cloacal swabbings were collected for virus isolation and blood was collected for antibody assays. Real time RT-PCR and antigen capture assays were performed on pooled tracheal swabbings. The birds were evaluated for respiratory and reproductive tract lesions.

The findings indicate that host species plays a key role when assessing the pathogenicity of the Delmarva LP H7N2 isolates. The relationships of the isolates as evaluated by reciprocal HI tests and gene sequencing will be discussed.

AAAP AWARDS LUNCHEON 11:30 AM—2:00 PM

Session B, Monday, July 18, 2005 **Moderator: Dr. David Swayne**

2:00—2:15 PM

Novel Diagnostic Tests for the Surveillance of Avian Influenza

Chinta M. Lamichhane, Synbiotics Corporation
Co-Authors: Emily Yeh, Eric Deshaies, and Ron Sanders

Novel diagnostic assays are developed for the rapid and efficient large-scale screening of Avian Influenza (AI) virus and associated antibodies. This study examines the sensitivity and specificity of the assays as they compare with that of the standard Agar-Gel immuno-Precipitin (AGP) antibody test, and virus isolation (VI). The efficacy of the above assays for the surveillance of AI antibodies and antigens is reviewed.

2:15—2:30 PM

Investigation of an Outbreak of Avian Influenza Subtype H2N2 in Two Commercial Layer Premises in Pennsylvania (2004)

David J. Henzler, Pennsylvania Department of Agriculture
Co-Author: Huaguang Lu

Avian influenza virus (AIV) subtype H2N2 was diagnosed in two commercial egg-layer premises in south Pennsylvania in the winter and spring of 2004. One premises each had over 800,000 hens in 6 flocks; the H2N2 AIV was isolated from 3 flocks, and serologic conversion was found in 5 flocks. The other premises had over 460,000 hens in 6 flocks; serum positive to H2N2 AIV was found in 4 flocks, but the H2N2 was not recovered. A low mortality was seen from retrospective record review, but both premises had no gross appearance of clinical diseases. The two (index) premises were the first documented case of H2N2 subtype AIV in commercial layers in Pennsylvania. Surveillance of 123 premises surrounding these two cases and 17 epidemiological contacts yielded no additional cases.

2:30—2:45 PM

Transmission of Low Pathogenicity Avian Influenza Virus (H6N2)

Peter R Woolcock, CAHFS, California Animal Health and Food Safety – Fresno Branch
Co-Author: Carol J. Cardona, and Jinling Li

Avian influenza virus (H6N2) was first detected in layers in 2000 in California, since then it has been isolated from broilers, turkeys and quail. It has been associated with increased mortality, decreased egg production, yolk sac peritonitis in layers and respiratory pathology in other birds. The rate at which virus could be recovered from chickens infected intranasally with 10^7 and 10^8 ELD_{50} virus was investigated. Virus was recovered from oropharyngeal swabs from 21 h to 124 h pi and from cloacal swabs from 36 h to 124 h pi. Recovery of virus from tissues was also investigated. The significance of these results will be discussed.

BREAK 2:45—3:00 PM

Session B, Monday, July 18, 2005 **Moderator: Dr. David Swayne**

3:00—3:15 PM

Identification of Key Human Activities and Their Role in a Quantitative Risk Assessment Model for Highly Pathogenic Avian Influenza

Antonio Vieira, The University of Georgia
Co-Authors: Dana Cole, Charles Hofacre, and Lee Myers

Highly Pathogenic Avian Influenza (HPAI) is a major risk to the poultry industry. A quantitative risk assessment model under development has identified key human activities likely associated with spread of virus in the event of an outbreak. Based upon this information and the epidemiology of previous outbreaks of poultry disease, a questionnaire ascertaining the nature and frequency of human exposures to poultry was administered to producers in 2 Georgia counties. The insights gained from this study will be of great importance for biosecurity, control programs and public health.

3:15—3:30 PM

Surveillance and Epidemiology for Avian Influenza in the New York Live Bird Markets

Susan C.,Trock, Cornell Univ. / NYS Agriculture & Markets
Co-Authors: Sung G. Kim, Michelle Gaeta, and Lisa Weisse, et al.

Live bird markets are a convenient sampling point for the live bird marketing system. It is estimated that 25 million birds move through this system annually. Birds found in the markets include waterfowl, game birds and chickens which come from many different sources, ranging from commercial operations to backyard flocks. Findings of avian influenza subtypes will be discussed in relationship to the number of isolates as well as the type of birds that are the source of these isolations in the market setting. In addition to bird sampling, data will be presented relative to samplings collected from the market environments.

3:30—3:45 PM

Use of a Multiplex RT-PCR to Differentiate Lentogenic NDV from END

Holly S. Sellers, The University of Georgia
Co-Authors: Erich G. Linnemann and Darrell R. Kapczynski

A multiplex RT-PCR has been designed to differentiate lentogenic Newcastle disease viruses from exotic Newcastle disease (END). Using computer sequence analysis and published sequences (GenBank), we have constructed lentogenic (B1/LaSota) and END (CA02)-specific primer sets. The primers amplify regions within the phosphoprotein and fusion protein genes of NDV. The primer sets have been tested in uniplex RT-PCR assays and amplify the predicted target templates. Our preliminary evaluation of the primers in a multiplex RT-PCR format suggests the primers will be effective in discriminating lentogenic and velogenic NDVs. The multiplex RT-PCR parameters have been optimized. RNA from archived NDV field isolates and END experimentally infected and uninfected chickens will be tested. The sensitivity and specificity is currently being determined.

Session B, Monday, July 18, 2005

3:45—4:00 PM

Contrasting Results from Molecular and Biological Pathogenicity Assays of Newcastle Disease Virus Isolate Iowa 1519

Daniel J. King, USDA, ARS, Southeast Poultry Research Laboratory
Co-Authors: Darrell R. Kapczynski, Claudio L. Afonso, and Andrea Piacenti

A Newcastle disease outbreak in turkeys in Iowa during the early 1970s was the source of an isolate identified as Iowa 1519. The isolate was classified as a neurotropic velogen based on an intracerebral pathogenicity index of 1.93, an intravenous pathogenicity index of 2.64, and neurotropic clinical disease and mortality following intracloacal inoculation of SPF chickens. However, nucleotide sequence analysis of the RT-PCR amplified product from the tested isolate stock revealed the fusion protein cleavage site amino acid sequence was typical of a low virulence Newcastle disease virus, the first isolate yielding contrasting results with different pathogenicity assays. Additional testing has revealed that the virus stock is a mixed population of low and high virulence components and demonstrates the potential risk of virus classification based on a single test. Testing of virus isolates from turkeys infected with the mixed population virus stock is being completed.

4:00—4:15 PM

REED RUMSEY AWARD

Reverse Genetics of Avian Metapneumovirus Subgroup C: Potential for Vaccine Development and Basic Studies

Dhanasekaran Govindarajan, University of Maryland, VA-MD Regional College of Veterinary Medicine
Co-Author: Siba K. Samal

Avian metapneumovirus (AMPV) causes acute respiratory infections in turkeys and “swollen head syndrome” in chickens. Currently available vaccines do not provide adequate protection against this emerging pathogen. Hence, with the ultimate goal of producing a live recombinant vaccine, we are currently involved in the establishment of a reverse genetics system for the US subgroup of AMPV. Towards this end, we have, for the first time, determined the complete genomic sequence of AMPV strain Colorado. We have also generated a full-length cDNA clone of the complete genome. Recovery of AMPV through established reverse genetics techniques is currently underway.

Session B, Monday, July 18, 2005

4:15—4:30 PM

RICHARD RIMLER MEMORIAL PAPER

Efficacy Trials of a Novel Avian metapneumovirus Vaccine

R.S. Bennett, University of Minnesota
Co-Authors: D. Lauer, R. Lippert, M.K. Njenga, and D.A. Halvorson

In 2001, we isolated a novel strain of aMPV from Canada geese that results in a non-clinical infection in turkeys. This strain has been completely sequenced and a large genetic marker has been identified which differentiates this novel vaccine stain from wild type infections. After virulent challenge, vaccinated/challenged birds showed a marked decease in both clinical signs, percent of birds showing clinical signs, and a decrease in challenge virus replication. Here we are reporting a side-by-side comparison of currently licensed aMPV vaccine and our novel aMPV vaccine (goose 15a) and the first field trial of this vaccine.

4:30—4:45 PM

Experimental Infection of SPF Laying Turkeys With Avian Pneumovirus Subtype C: Possible Role of Vertical Transmission

Darrell R. Kapczynski, USDA-ARS-Southeast Poultry Research Laboratory

Avian metapneumovirus (aMPV) is responsible for a highly infectious respiratory disease of turkeys. Although wild birds have been identified as possible vectors for transmission, few reports have examined vertical transmission (VT) of aMPV from hen to poult. In an effort to determine the potential transmission of aMPV by VT, SPF laying turkey hens were experimentally infected with aMPV subtype C and eggs examined for the presence of virus during a one-week post-inoculation period. Preliminary results indicate the presence of virus, by RT-PCR and virus isolation, on the egg shell and in the embryo.

4:45—5:00 PM

The Role of Cell Mediated Immunity in Avian Pneumovirus (APV) Infection of Turkeys

Martin M.R. Liman, Veterinary School Hannover, Germany
Co-Author: Silke Rautenschlein

Avian Pneumovirus (APV) infection of turkeys results in great economic losses worldwide. In order to improve current vaccination strategies, more needs to be known about cell-mediated immune reactions following APV infection of turkeys.

In this study we compared the immunopathogenesis of APV subtype A and B infection. We evaluated the local and systemic stimulation of T-cell and macrophage activity following infection of turkeys with APV subtype A and B.

ADJOURN

Session A, Tuesday, July 19, 2005 **Moderator: Dr. Tim Cummings**

8:00—8:15 AM

Control of Cellulitis in Commercial Chickens

Daniel Karunakaran, Cargill Turkey Production LLC

The incidence of cellulites in commercial turkeys has increased in the recent years. In most cases the disease is caused by Clostridium. This disease is of economic importance to the turkey industry as it results in late mortality in heavy toms. Clostridia are very resistant as they are spore formers. On the farm clean up efforts are difficult.

Biological control effort was made in a commercial operation using Bacillus subtillis. The results are very encouraging. Biological control in much more cost effective than antibiotic based medication programs. The results from this field study involving over a million turkeys will be presented.

8:15—8:30 AM

Effect of Organic Selenium on Broiler Chicken Feathering, Skin Strength, and Cellulitis Prevalence

Martine Boullianne, University of Montreal
Co-Author: Ghislaine Roch

Various risk factors have been associated with cellulitis in broiler chickens. A previous epidemiological study demonstrated that feathering was the most important factor with all poorly feathered flocks belonging to the high prevalence cellulitis group. Organic selenium has been shown to increase feather development. Our objective was to verify the effect of 0,3 and 0,15 ppm of organic selenium vs 0,3 ppm of inorganic selenium, added to the diet on broiler chicken on feathering, skin strength and cellulitis prevalence. In order to increase risks of cellulitis, a pathogenic *E. coli* strain isolated from cellulitis lesion and made resistant to nalidixic acid (NAL) was sprayed on the litter twice during growout.

8:30—8:45 AM

Brown Discoloration of Processed Broiler Carcasses

Susan B. Lockaby, CS Roberts Veterinary Diagnostic Laboratory
Co-Author: Frederic J. Hoerr

Two cases of brown staining of processed broiler carcasses were submitted for laboratory evaluation. In both cases, the carcasses were in contact with water containing high levels of iron. Case histories, gross and histologic findings, and ancillary results will be presented and discussed.

Session A, Tuesday, July 19, 2005

8:45—9:00 AM

Attempts to Develop a Predictable Model for Gangrenous dermatitis in Broilers

S. R. Collett, The University of Georgia
Co-Authors: John R. Glisson, Charles L. Hofacre, and Stephan G. Thayer

Gangrenous dermatitis was recently identified as a re-emerging disease in the USA broiler industry having been of limited importance since it was first reported in the sixties. The only reported challenge model for this condition involves subcutaneous injection of the causative organisms, *Clostridium perfringens* type A, *Clostridium septicum* or *Staphylococcus aureus* which causes death rapidly and precludes investigation as to predisposition and cause. Several attempts were made to predictably reproduce gangrenous dermatitis in broilers under conditions that simulate the field situation. Both vegetative and spore forms of the Clostridial species implicated were used to contaminate artificially scratched skin.

9:00—9:15 AM

Acute Hemorrhagic Enteritis and Necrotizing Hepatitis in Two-Day-Old Broilers due to a Clostridium perfringens Contaminated Animal Byproduct Feed Ingredient

Stephen W. Davis, Colorado Quality Research, Inc.

An acute case of hemorrhagic enteritis and necrotizing hepatitis with very high mortality and morbidity occurring in two day-old broilers will be presented. Hepatic and intestine cultures of dead and moribund birds found heavy growth of *Clostridium perfringens.* Broilers within the effected flock that were fed a growth promoting antibiotic were unaffected while broilers consuming the same feed without an antibiotic experienced severe acute mortality of over 10% by five days-of-age. Removing the antibiotic treated feed from the unaffected broilers and feeding the same feed without antibiotic resulted in acute disease and mortality in the previously unaffected broilers. Complete feed and fishmeal ingredient cultures of the feed associated with the case resulted in extremely heavy growth of *Clostridium perfringens*. Gross and histopathology lesions will be presented along with mortality and culture results.

9:15—9:30 AM

Clinical Investigation of a Runting and Stunting Syndrome in Georgia

Guillermo Zavala, The University of Georgia
Co-Author: Holly Sellers and Louise Dufour-Zavala

Severe loss of uniformity and delayed body weight gain were observed in broilers during 2004 and 2005. The syndrome was characterized by overall slow growth and low uniformity during the first two weeks of age. Watery diarrhea, pale and thin intestines and excessive litter moisture were commonly observed. The primary microscopic lesion was cystic enteropathy. An investigation was conducted to include or exclude the role of feed, environment or infectious disease. The syndrome was partially reproduced experimentally in SPF and broiler chickens in the form of severely delayed growth and loss of uniformity.

BREAK 9:30—10:00 AM

Session A, Monday, July 18, 2005 **Moderator: Dr. John Glisson**

10:00—10:30 AM **LASHER HISTORY LECTURE**

"History of the National Poultry Improvement Plan"

Andrew Rhorer

10:30—12:00 PM **AAAP BUSINESS MEETING**

Session A, Monday, July 18, 2005 **Moderator: Dr. Stephen W. Davis**

1:00—1:15 PM

Turkey and Chicken Coccidiosis Control with the Feed Additive Amprolium

Greg F. Mathis, Southern Poultry Research Inc.
Co-Author: Hector Cervantes

A series of anticoccidial sensitivity tests both battery and floor-pen were designed to determine the feed additive Amprolium's current anticoccidial control both in turkey and chicken coccidial isolates. Amprol and Amprol Plus proved to be very effective against chicken isolates that were predominately E. tenella with moderate control of E. acervulina and E. maxima. Less control of these two species is probably more of an efficacy issue that a resistance issue. Anticoccidial control by Amprol 125 ppm to turkey coccidial isolates was similar to Coban 73 ppm and Avetec 89 ppm.

Session A, Tuesday, July 19, 2005

1:15—1:30 PM

High Fecal Oocyst Counts of E. maxima Associated with Non-specific Enteritis and Necrotic Enteritis in Broilers

Miguel Ruano, Perdue Farms Incorporated
Co-Authors: Bruce Stewart-Brown, Douglas Marvil, Henry Engster

Several cases of both non-specific enteritis and early stages of necrotic enteritis were linked to high fecal oocyst counts of *E. maxima.* Moderate fecal oocyst counts of *E. maxima* cycling at two weeks of age with moderate sloughing of the intestinal lining were associated with non-specific enteritis. High fecal oocyst counts of *E maxima* between 2 and 3 weeks of age associated with severe sloughing of the intestinal lining was found at early stages of necrotic enteritis. Conventional medication to control the high level of replication of *E. maxima* during the early stage of necrotic enteritis was able to control both the coccidiosis and the mortality due to the subsequent development of more advanced stages of necrotic enteritis. However, microscopic examination of smears prepared from mucosal scrapes during advanced stages of necrotic enteritis, was not directly correlated with the presence of high numbers of oocysts of *E. maxima*.
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1:30—1:45 PM

Comparative Pathology of *Eimeria acervulina* and *E. mivati* of the Chicken

Steve H. Fitz-Coy, Schering-Plough Animal Health
Co-Author: Richard Phillips

Eimeria acervulina was described in 1929 by E. Tyzzer. Since then, several researchers have described this species as moderately pathogenic; causing weight suppression, impaired feed conversion, loss of pigment, loss of egg production of laying hens. Elongated white plaques arranged transversely, severe infections the white plaques may coalesce. Some researchers have reported mortality with E. acervulina.

Edgar in 1964 described *E. mivati* as highly pathogenic species of coccidia; causing morbidity and mortality, weight and feed conversion impairment. Pathological findings are hyperemia, small white spots, mucus production, hemorrhage into the lumen and slight to moderate swelling of the intestinal tissue.

1:45– 2:00 PM

The Pathogenesis and Treatment of *Hexamita meleagridis* Infection in Turkeys

Alex J. Bermudez, University of Missouri
Co-Authors: Paula Butkeraitis, and Yvette M. Broomhead

Hexamitiasis is a classic disease of poultry which is re-immerged in the turkey industry as a significant production problem. The presentation will describe the isolation and purification of a *H. meleagridis* inoculum, pathology and production effects of this parasite, and evaluation of a potential treatment of this disease in turkeys. The specific treatment regimen that will be evaluated is oxytetracycline in the drinking water at 35mg/kg body weight.

Session A, Tuesday, July 19, 2005

2:00—2:15 PM

Blackhead Treatment in Broiler Breeder Pullets
Bret Rings, Tyson Foods, Inc.
Co-Author: Travis Glenn

A 2 house pullet farm in central Missouri had several consecutive flocks with mortality due to blackhead. Mortality in these flocks would often exceed 10% from histomoniasis. These flocks were treated with a number of different control strategies that all proved to be unsuccessful. A discussion with a colleague communicated anecdotal treatment information that was a potentially effective therapy in treating disease from *Histomonas meleagridis*. This treatment consisted of the use of water soluble 3-Nitro (Roxarsone) and more recently the use of sulfadimethoxine. Both of these products have been efficacious as both prophylactic and therapeutic strategies to control the incidence and reduce the mortality associated with histomoniasis. This has not only been an effective approach on this farm but also at other locations.

2:15—2:30 PM

Transmission of blackhead disease in chickens

L. R. McDougald, University of Georgia
Co-Authors: J. Hu, L. Fuller, and P. Armstrong

Chicks were inoculated cloacally with Histomonas meleagridis and allowed to commingle with others in floor pens. There was no confirmed transmission of blackhead to uninoculated birds. A second study evaluated the effects of feed restriction on blackhead. Seeder birds developed blackhead, but uninoculated birds did not develop lesions by 42 days. Chickens inoculated cloacally with H. meleagridis in battery cages had lesions of blackhead, but the infection did not spread to uninoculated birds. The lack of contagion in these studies suggests that the dynamics of blackhead transmission in chickens differs significantly from that reported for turkeys.

BREAK 2:45—3:00 PM

Session A, Tuesday, July 19, 2005 **Moderator: Dr. Greg Mathis**

3:00—3:15 PM

Protective Immunity Against *Eimeria acervulina* Following *In ovo* Immunization with a Recombinant Subunit Vaccine and Cytokine Genes

Hyun S. Lillehoj, USDA-Agricultural Research Service
Co-Authors: Xicheng Ding, M.A. Quiroz, E. Berensee, and Rami Dalloul

Recombinant protein from Eimeria acervulina was used to vaccinate chickens in ovo against coccidiosis both alone and in combination with expression plasmids encoding various chicken cytokines. Chickens vaccinated with 3-1E protein showed significantly lower oocyst shedding and normal body weight gain compared with non-vaccinated and infected controls. Simultaneous immunization of 3-1E with the IL-2, -15, -17, -18, or IFN-g genes further reduced oocyst shedding compared with that achieved with 3-1E alone. These results provide the first evidence that in ovo vaccination with the recombinant 3-1E Eimeria protein induced protective intestinal immunity against coccidiosis and this effect was enhanced by co-administration of genes encoding immune-related cytokines.

3:15—3:30 PM

Safety, Efficacy and Performance of a Live Coccidiosis Vaccine

Vivian W. Doelling, Embrex, Inc.
Co-Authors: Cherilyn L. Heggen-Peay, Greg R. Mathis, Alison Martin, Larry M. Charniga, and Rebecca M. Poston

Safety and performance trials were conducted using a coccidiosis vaccine composed of live oocysts from several *Eimeria* strains. Embryonated broiler eggs were vaccinated *in ovo* and hatched birds placed in floor pens. Both bird weight and feed conversion were monitored at Day 21, 35, 42 and 49. Performance of both salinomycin-fed control birds and vaccinated birds was statistically similar at all time points monitored. For the efficacy portion of the trial, birds were placed in floor pens, challenged, and lesion scored 6 days later. Results indicated excellent protection of vaccinated birds as shown by significant reduction in intestinal lesions.

3:30—3:45 PM

Comparison of Safety and Efficacy of an *in ovo* Coccidiosis Vaccine between Different Breeds of Commercial Broilers

Cherilyn L. Heggen-Peay, Embrex, Research and Development
Co-Authors: Rebecca M. Poston, Alison G. Martin, Jim E. Hutchins, Heather E. Boyette, and Vivian W. Doelling

To compare the safety and efficacy of an in ovo coccidiosis vaccine across broiler breeds, two breeds of commercial broilers were compared: Cobb x Cobb and Ross x Ross. At E18, embryonated broiler eggs were vaccinated by in ovo injection. Percent hatch was comparable among all treatments, demonstrating vaccine safety. At 20-21 days of age, birds were challenged with a single Eimeria strain. Excellent protection as indicated by significant lesion score reduction was demonstrated in both breeds. These data indicate that the in ovo coccidiosis vaccine is safe and efficacious across breeds of commercial broilers.

3:45—4:00 PM

Chicken anemia virus (CAV) Types from Vaccinated and Unvaccinated Commercial Broilers Flocks: Characterization and Comparison

Franz Sommer, UC Davis/CAHFS - Turlock Branch Laboratory
Co-Authors: Bruce W. Charlton, Carol J. Cardona

We examined 12 broiler flocks in commercial farm settings for the presence of chicken anemia virus (CAV) with PCR. Six of the flocks were vaccinated with a commercially available CAV vaccine, and the other six flocks, grown either consecutively with or in parallel with the experimental flocks and served as negative controls. To gain information on the occurrence of vertically-transmitted CAV and its persistence in broilers and the role of field exposure as well as the effect of vaccination, CAV strains isolated from broilers at different ages were partially sequenced and compared. The results of these examinations will be presented.

4:00—4:15 PM

Transmissible Viral Proventriculitis in North Carolina Broiler Chickens

R. Monleon, North Carolina State University
Co-Authors: Matilde Alfonso, John Radu, James S. Guy, and H. John Barnes

Broiler flocks from 3 integrators located in different geographical regions in North Carolina were examined for gross and microscopic lesions of transmissible viral proventriculitis (TVP). Proventriculi were examined and collected from 5-6 birds in 33 flocks (n = 174). Two out of three integrators were found to have birds with proventriculitis by gross examination, with a prevalence of 20% (11 out of 54) and 18% (11 birds out of 60). Lesions found at necropsy were scored according to severity (0=no lesion, 3=severe TVP lesions). After fixation and trimming of proventriculi, they were re-evaluated for gross lesions. The results indicated a wide range of lesion severity both within flocks and integrators. Further histopathologic and virologic studies are in progress and will be presented along with the data on prevalence.

4:15—4:30 PM

Characterization of a Novel Adenovirus Associated as the Cause of Transmissible Viral Proventriculitis of Broiler Chickens

James S. Guy, NCSU College of Veterinary Medicine
Co-Authors: John Barnes, and Lynda Smith

A novel adenovirus-like virus (AdLV [R11/3]) was associated as the cause of transmissible viral proventriculitis based on electron microscopic (EM) and immunohistochemical detection in lesional sites. The virus was propagated in embryonated eggs and identified via electron microscopy as icosahedral, approximately 70-nm in diameter, with morphogenesis in cell nuclei. Immunohistochemical and PCR procedures using antisera and oligonucleotide primers specific for groups I, II and III avian adenoviruses failed to recognize AdLV [R11/3], suggesting that this virus is distinct from known avian adenoviruses. Additional studies are in-progress to further characterize the virus (density, presence/absence of envelope, nucleic acid characterization, pathogenicity studies).

Session A, Tuesday, July 19, 2005

4:30—4:45 PM

Evaluation of the Use of a Commercial *Pasteurella multocida* Vaccine administered by the Drinking Water in Broiler Breeder Pullets

Jose Juan Bruzual, University of Georgia
Co-Authors: Andrea Sinclair, John Glisson, and Charles Hofacre

Historically live *Pasteurella multocida* vaccines have been administered to the broiler breeder by wing web application. This method requires handling every bird which can result in injuries and a high labor cost. Therefore, a commercial live *Pasteurella multocida* vaccine (PM-1) will be evaluated for use in the drinking water of Broiler breeder pullets versus administration by the wing web. The birds will be evaluated for severity of the reaction and also for protection from a virulent challenge of a Pasteurella multocida serotype 1 (X-73).

Session A, Tuesday, July 19, 2005

4:45—5:00 PM

The Interaction between *E. coli* and Newcastle Disease Virus in Chickens

Amna B. Eltayeb, The Ohio State University
Co-Author: Robert P. Hanson

The interaction between Newcastle disease virus (NDV) and *E. coli*) was investigated in cell cultures, embryonated eggs, and 8-week-old chickens. The interactions were measured on the basis of bacterial adherence and NDV hemagglutination titer in both chickens and chicken embryos. Depending on the inoculation order of *E. coli*, a significant ($p<0.05$) alteration of the growth of NDV was observed in both chicken and chickens embryos. Adherence of *E. coli* to chicken embryo kidney (CEK) cells was significantly increased ($p<0.05$) when the CEK cells were infected with NDV first and then followed by *E. coli*.

ADJOURN

Session B, Tuesday, July 19, 2005 Moderator: Dr. Margie Lee

8:00—8:15 AM .

A Subunit Vaccine for controlling *Salmonella* Enteritidis in Chickens

Darren E. Straub, Epitopix
Co-Authors: Daryll A. Emery, Jim D. Sandstrom, Larry M. Slinden, and Doug T. Burkhardt

Salmonella Enteritidis (*S*E) is a foodborne pathogen primarily associated with the consumption of contaminated eggs. In these studies and previous investigations we have demonstrated the efficacious nature of a subunit vaccine consisting of outer membrane Siderophore Receptor and Porin proteins (SRP®) as vaccine candidates for controlling *Salmonella* in domestic poultry. In the present investigation two vaccine formulations utilizing the SRP-technology were evaluated against a live *S*E challenge in SPF chickens. The trial examined quantitative clearance of SE from internal organs and fecal shedding between vaccinated and non-vaccinated birds after challenge. These results will be discussed in greater detail.

8:15—8:30 AM

The Relationship between Intestinal Persistence and Egg Contamination for Strains of *Salmonella enteritidis* and *S. Heidelberg*

Richard K. Gast, USDA-ARS-SEPRL, Russell Research Center
Co-Authors: Jean Guard-Bouldin, and Peter S. Holt

Egg contamination by *Salmonella enteritidis* remains a significant public health problem and is the target of a recently proposed FDA regulatory plan. *Salmonella heidelberg* has also been implicated in egg-transmitted human illness. Intestinal colonization is a necessary precursor to the invasion of reproductive organs and egg contamination, but the relationship between the persistence of *Salmonella* in the intestinal tract and the likelihood of egg contamination is not clear. In the present study, strains of *S. enteritidis* and *S. heidelberg* that had been previously re-isolated from infected hens were more persistent in the intestines of experimentally inoculated chickens than were the original parent strains, and caused more frequent egg contamination, but intestinal persistence and egg contamination were not strongly correlated for any of these strains.

8:30—8:45 AM

Detection of *Salmonella* using a Real-Time Polymerase Chain Reaction and Hybridization Probes Format

Ricardo Munoz, IDEXX Laboratories, Inc.
Co-Author: P. Tyrrell

A real-time polymerase chain reaction (PCR) assay to detect the presence of *Salmonella* in cultures from environmental sources has been evaluated. The assay utilized a set of hybridization probes to detect a conserved sequence of the *Salmonella* genus using the fluorescence resonance energy transfer (FRET) mode of detection. The real-time PCR was compared to standard culture methods for *Salmonella* as defined by the National Poultry Improvement Plan. In the comparison, the PCR detected all culture positive samples and was not influenced by the type of environmental sample. Use of the PCR with enrichment cultures allowed for the distinction between *Salmonella* positive and negative cultures. With the PCR, laboratories could distinguish between *Salmonella* positive and negative cultures and focus the laboratory resources on the positive cultures for further identification of the *Salmonella* group present in the culture.

Session B, Tuesday, July 19, 2005

8:45—9:00 AM

Distribution of Fimbrial, Phage and Plasmid Associated Virulence Genes among Poultry *Salmonella enterica* Serovars

John J. Maurer, The University of Georgia
Co-Authors: Rachel Whitaker, Charles L. Hofacre, and Margie D. Lee

Virulence genes are frequently found on large mobile genetic elements, such as bacteriophages or plasmids. There is considerable genetic variability among *S. enterica* as evident with its multitude of serovars, and yet only a handful cause disease in man. Are these differences attributed to distribution of these genetic elements among serovars? *Salmonella* isolates were screened for several virulence genes associated with virulence plasmid and prophages. One of the major genetic differences among poultry *Salmonella* serovars was in the distribution of these genetic elements. While it is important for the poultry industry to reduce *Salmonella* contamination, aggressive eradication/control programs might be directed towards pathogenic serovars *S. typhimurium* and *S. enteritidis*.

9:00—9:15 AM

Development and Evaluation of a Recombinant Strain based on the *sef*ABCD fimbrial operon against *Salmonella enterica* serovar Enteritidis in Chickens

Vanessa C. Lopes, University of Minnesota
Co-Authors: Binu T. Velayudham, Douglas N. Foster, David A. Halvorson, and Kakambi V. Nagaraja

Salmonella Enteritidis has been recently perceived as threat to the public health worldwide. Due to its relevance to food safety, several vaccines have been developed to control *S.* Enteritidis in poultry. A significant difficulty faced by numerous vaccines to *S.* Enteritidis is the partial protection elicited, which allows for shedding of the pathogen to other birds, along with potential for vertical transmission and contamination of eggs. This study describes the development of a recombinant strain based on the *sef*ABCD fimbrial operon of *S.* Enteritidis and assesses the protection elicited in chickens against a challenge.

Session B, Tuesday, July 19, 2005

9:15—9:30 AM

Experimental Campylobacter Infection in Immunosuppressed and Normal Broilers

A. Singh Dhillon, Washington State University
Co-Authors: H. L. Shivaprasad, Dennis M. Schaberg, Fonda Wier, Daina V. Bandli, and Sylvia K. Weber

One-day old 220 broilers were subdivided into 10 groups of 20 chicks and housed in Horsfall units. Commercial broiler feed and water was provided *ad libitum*. Five groups of chicks were inoculated with IBDV Varient E strain at one day of age. Three Isolates of Campylobacter jejuni of poultry origin and one of human origin were propagated.

Four groups of chicks were inoculated individually with one of the Campylobacter spp. containing 0.5 ml of $1´10^2$ CFU of Campylobacter by crop gavage at 9 days of age.

Four groups of chicks that were inoculated with IBDV Varient E strain at one day of age were inoculated similarly with one of the Campylobacter Spp. One group was kept as an uninoculated control and another one group was kept as an IBDV Varient E strain control. At 14, 21 and 28 days of age four chicks were collected at random from each treatment group. These chicks were euthanized, necropsied, and the intestinal tissues were cultured for Campylobacter enumeration and histopathology. All chicks were weighed at 7, 14, 21, 28 days of age and statistical analyses performed. The study was terminated at day 28. Reduced body weights were observed at different weighing intervals in the IBDV Varient E strain and Campylobacter inoculated groups but not in the only Campylobacter inoculated groups. Results of *Campylobacter* enumeration from the ceca were 2 to 4 logs higher as compared to the upper and mid intestine samples. *Campylobacter* was not isolated from the intestines of day old broilers or the uninoculated controls at different intervals.

BREAK 9:30—10:00 PM

Session B, Tuesday, July 19, 2005 **Moderator: Dr. Bruce Stewart-Brown**

1:00—1:15 PM

Novel Clostridia that Colonize the Small Intestine of Young Broilers

Margie D. Lee, The University of Georgia
Co-Authors: Charles L. Hofacre, and Jingrang Lu

Our microbial ecology studies of the chicken intestine indicate that some diets result in small intestinal communities rich with clostridia of unknown virulence. While the cytotoxic activities of pathogenic clostridia have been well studied, similar activity associated with commensal isolates has not been investigated. The toxins of pathogenic clostridia often exhibit enzymatic activity on host macromolecules. In order to study the effects of these novel clostridia on the host, we produced a metagenomic library of intestinal bacterial community DNA and screened it for hydrolytic enzymatic clones. We did not detect phospholipase-producing clones indicating that these bacteria were unlikely to produce α-toxin activity.

Session B, Tuesday, July 19, 2005

1:15—1:30 PM

Comparison of Competitive Exclusion Products On the Level of Tetracycline Resistant Coliforms in the Broiler Chicken Environment

Andrea J. Sinclair, The University of Georgia
Co-Authors: Stephen R. Collett, and Margie D. Lee

Drug resistance genes are common in intestinal bacteria of chickens which attracts consumer concern. Since there may be a "fitness cost" associated with carriage of resistance genes, as chromosome capacity is limited, four competitive exclusion strategies were used to apply selection pressure against tetracycline resistance carriage. Each treatment was monitored for change in prevalence of tetracycline resistance in intestinal and litter coliforms over five consecutive broiler grow out cycles.

1:30—1:45 PM

Influence of Nitric Oxide Production on Marek's Disease in Broiler Breeder Lines

Karel A. Schat, Cornell University
Co-Authors: Priscilla H. O'Connell, Celina Buscaglia, Keith W. Jarosinski, and Igal Pevzner

Two broiler lines A and B, obtained from a primary breeder, were examined for their potential to product nitric oxide (NO) after stimulating splenocytes from 20-day-old embryos with LPS and interferon-gamma. Significant differences were found between line A and B. Line A had the higher response but also large amounts of variation between individual sire families. Offspring from sire families with high (group 1), intermediate (group 2) and low NO (group 3) production from line A were challenged with RB-1B Marek's disease (MD) virus. Virus isolation rates at 6 and 10 days post infection were not significantly different, but the MD incidence in group 1 was significantly higher than in the other two groups.

1:45—2:00 PM

Gene Deletion Mutants of Marek's Disease Virus: The Next Generation of Recombinant Vaccines?

Lucy F. Lee, U.S. Department of Agriculture
Co-Authors: Robert Silva, Mohammad Heidari, and Sanjay Reddy

Marek's disease (MD), a virus-induced cancer-like disease of chickens. Vaccination has dramatically reduced the incidence of the disease, but more virulent viruses are emerging and developing of new control strategies is needed. W**e** have generated several gene deletion mutants of MDV such as rMd5/Δpp38, rMd5/ΔvIL8, rMd5/ΔMeq, and rMd5/ΔLORF11. Some of these mutants have great potential for protecting chickens against tumor development. Further modification of these mutants may significantly increase the efficiency of protection and can be the future generation of recombinant vaccine for control MD.

Session B, Tuesday, July 19, 2005

2:00—2:30 PM

Virus-induced Avian Atherosclerosis: Past and Future

Julius Fabricant, Cornell University

A review of the work of Catherine Fabricant and her colleagues that described: (1) The role of Marek's disease virus as the cause of avian atherosclerosis and (2) the pathogenesis and biochemical mechanisms that produce the lesions. A further review of the potential role of herpesviruses in human atherosclerosis and a discussion of areas or research made possible by more recently developed techniques will be presented.

BREAK 2:45—3:00 PM

Session B, Tuesday, July 19, 2005 **Moderator: Dr. Ton Schat**

3:00—3:15 PM

Pathotyping of Russian Isolates of Marek's Disease Virus

K.Dudnikova, Ivanovski Virology Institute, Moscow, Russia
Co-Authors: S.Norkina, A.Vlasov, A.Slobodchuk, R.L.Witter*

The object of our study was the characterization of Marek's disease virus strains isolated in Russia and their comparison with reference strains. Marek's disease was diagnosed in 4 regions of Russian Federation in breeder flocks. Six viruses of serotype 1 were isolated. These isolates were pathotyped in SPF chickens. Responses were compared to those induced by Avian Disease and Oncology Laboratory (ADOL) reference strains JM/102W, Md5, and 648A. The Russian isolates caused 20% to 100% early mortality syndrome. As result of the conducted experiments we determined the pathotype of three isolates as vv and other three isolates as vv+. Additional strains are under evaluation.

Session B, Tuesday, July 19, 2005

3:15—3:30 PM

Biological Characterization of a Mutant Marek's Disease Virus lacking the UL41 Gene (rMd5ΔUL41)

Isabel M. Gimeno, USDA-ARS Avian Disease and Oncology Laboratory
Co-Author: Robert F. Silva

A virion host shutoff (vhs) gene has been described in various herpesviruses. In particular, the herpes simplex virus (HSV) UL41 gene has been well characterized and its role on HSV pathogenesis is well understood. Marek's disease virus (MDV) UL41 gene is a homologous of the HSV UL41 gene but its biological function is unknown. The aim of this study was to utilize a mutant MDV (rMd5ΔUL41) lacking the UL41 gene to characterize the biological function of UL41 gene. The role of UL41 gene on MDV replication, transmission, neurovirulence, transformation and viral regulation of latency, reactivation and immune response is presented.

3:30—3:45 PM

Comparison of Two Ostensibly Identical Recombinant MHC haplotypes in Fully Congenic Lines in their Response to Challenge with vvMD

Patricia Wakenell, Department of Population Health and Reproduction, UC-Davis
Co-Authors: Marcia Miller, and Robert Taylor

Two nearly identical congenic lines of chickens, R2 and R4, recombinant at the major histocompatibility complex were compared for resistance to vv MDV challenge. This work was an attempt to replicate, using fully congenic lines, a small pilot study conducted by Schat, et al, in 1994. The lines of chickens were obtained as eggs from Robert Taylor and were hatched and raised at UCD. Marcia Miller conducted haplotyping of the test chickens to confirm lineage. All chickens were inoculated at 5-6 days of age with the RB1B strain of MDV and were observed for 75 days PC. All birds dying before termination and at termination were examined grossly. Birds negative for gross lesions of MDV were examined microscopically. Significant differences in resistance to MD were observed between the two lines.

Session B, Tuesday, July 19, 2005

3:45—4:00 PM

Molecular Characterization of the Marek's Disease Virus vhs Gene (UL41)

Robert F. Silva, USDA/ARS Avian Disease and Oncology Laboratory
Co-Author: Isabel M. Gimeno

Herpesviruses use multiple means to help them evade host defenses. One method is through a herpesvirus gene product called virion host shutoff protein (vhs). vhs causes a rapid shutoff of all host proteins. The Marek's disease virus (MDV) UL41 gene is a homolog of the herpes simplex virus vhs. To investigate whether the MDV UL41 functions as a vhs, we characterized the MDV UL41 gene. We will present data on the cloning, expression and deletion of the MDV UL41 gene.

4:00—4:15 PM

Functional Characterization of MDV CVI988 Meq Protein using a Retrovirus Expression System

Dharani K Ajithdoss, Texas A&M University
Co-Authors: Sanjay M. Reddy, and Blanca Lupiani

Marek's disease (MD), caused by Marek's disease virus (MDV), an alpha herpesvirus, is an economically important disease of chickens. MD has long been controlled by the use of live attenuated vaccines. CVI988, a serotype 1 virus is the most efficacious MDV vaccine available and like other pathogenic strains encodes an oncoprotein, Meq. We will discuss the functional characterization of the Meq protein from MDV CVI988 strain in comparison with the Meq protein of a highly pathogenic MDV strain using a retrovirus expression system. The findings will be helpful in the design of superior vaccines that can protect chickens against more virulent MDV strains.

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Session B, Tuesday, July 19, 2005

4:15—4:30 PM

The Physiology of *In Ovo* Vaccination

Christopher J. Williams, Embrex, Inc

In ovo vaccination principles exist and are fundamental to understanding the physiology of the hatching chick's immune response, as well as to how tolerant the embryo is to this relatively invasive technology. Standard application procedures are reviewed herein, and these procedures can be expanded and applied as qualitative measurements to both laboratory and commercial application methods. Discussions shall be presented with respect to the physiological challenges of injection techniques, aseptic vaccine preparation, hatchery hygiene, and sanitation requirements. Additionally, the interactions between embryonic age at injection, hatchability, compartmentalized delivery, and immune response will be reviewed.

4:30—4:45 PM

Detection of Avian Respiratory RNA Viruses by Multiplex RT-PCR

Huaguang Lu, Wiley Laboratory, The Pennsylvania State University
Co-Authors: Zhigin Xie, and Lin Lin

Multiplex RT-PCR has been studied for the detection of avian respiratory RNA viruses including avian influenza virus (AIV), infectious bronchitis virus (IBV), paramyxovirus type 1 (PVM-1), and avian pneumvirus (APV) in the Animal Diagnostic Laboratory of Penn State University. Several multiplex primer sets have been developed to detect these RNA viruses simultaneously in one reaction. In our present study, we have successfully developed a multiplex RT-PCR for AIV, PMV-1 and IBV, a multiplex RT-PCR for PMV-1, IBV and APV, and a multiplex RT-PCR for all subtypes of AIV general and specific for H5 and H7 subtypes. These multiplex RT-PCRs are highly sensitive and specific in the amplification of each virus RNA target.

4:45—5:00 PM

Disease and Lesions in the Nervous System

Richard J. Julian, Ontario Veterinary College, University of Guelph

Lesions in the central and peripheral nervous system and eyes may be caused by physical damage, toxns, nutritional deficiency, infectious agents or neoplasia. Some of these conditions will be described and illustrated.

The goal is to stimulate interest in a Slide Study Set for AAAP and to solicit additional slides to produce a set on Neurological Disorders in Poultry

ADJOURN

Session A, Wednesday, July 20, 2005 **Moderator: Dr. Oscar Fletcher**

8:00—8:15 AM

Plasmids in APEC Virulence and Antimicrobial Resistance: An Overview

Lisa K. Nolan, Iowa State University
Co-Authors: Timothy J. Johnson, Kylie E. Siek, and Jerod A. Skyberg

Previously we reported that large conjugative plasmids occur commonly among APEC and that they contain many of the genes known to contribute to APEC virulence and/or antimicrobial resistance. Possession of these plasmids may be the defining trait of the APEC pathotype. Over 80% of APEC but much fewer of the commensal *E. coli* from healthy birds contain genes or traits associated with these plasmids. When transferred by conjugation into plasmid-less recipient strains, the transconjugants acquire the abilities to resist therapy or cause disease. Recent sequencing efforts have demonstrated that both R and virulence plasmids of APEC are mosaic-like structures characterized by variable G + C ratios and numerous mobile elements, suggesting that these plasmids may be the result of a complex evolution. Such transmissible plasmids may serve as a reservoir of resistance and virulence genes for other important bacterial pathogens

8:15—8:30 AM

Biofilm Formation on Plastic Surfaces by *Escherichia coli* Isolated from Sick and Healthy Poultry

Jerod A. Skyberg, Iowa State University
Co-Authors: Kylie E. Siek, Curt Doetkott and Lisa K. Nolan

Through biofilm elaboration, bacteria become more resistant to physical, chemical, and environmental stresses, and better able to acquire transmissible genetic elements. In this study the prevalence of biofilm production among avian *Escherichia coli* isolates was determined. Using a microtiter method, 208 avian *E. coli* isolates (105 from sick birds, and 103 from healthy birds) were assayed for biofilm production. Results were then compared with the organisms' O-group, virulence genotype, and phylogenetic group. Preliminary analysis suggests that strong or moderate biofilm formation is much more likely to be found in *E. coli* isolated from healthy birds rather than sick birds. Also of interest is that biofilm formation under these conditions seems to occur more often in isolates belonging to phylogenetic group A and may have some association with the O73 serogroup. No correlation was found between an isolate's ability to form biofilms and its possession of certain adhesin genes.

8:30—8:45 AM

Application of Real Time-PCR in the Diagnosis of infectious Laryngotracheitis during an Outbreak of the Disease

Ivomar Oldoni, The University of Georgia
Co-Authors: Sylva Riblet, Kelli Jones, Scott Callison, Guillermo Zavala, and Maricarmen Garcia

Infectious laryngotracheitis virus (ILTV) is the causative agent of a highly contagious upper respiratory tract infection in chickens. Approximately 300 tracheal swabs were collected from several affected broiler flocks during a recent outbreak of the disease. The objective of this study is to evaluate the application of ILTV Real Time PCR as a rapid diagnostic test to detect infected birds during an outbreak situation. To evaluate the efficiency of the Real Time PCR samples will be simultaneously screened by virus isolation (VI). Initial results predict a good correlation between VI and Real Time-PCR results.

Session A, Wednesday, July 20, 2005

8:45—9:00 AM

Genotyping Infectious Laryngotracheitis Virus by Multiple Gene Sequencing

Maricarmen García, University of Georgia
Co-Authors: Sylva M. Riblet, Ivomar Oldoni, and Shulei Sun

Infectious laryngotracheitis virus (ILTV) is an acute respiratory disease of chickens that affects poultry worldwide. Waves of the disease are observed in US one or twice a year particularly in areas of dense broiler production. In an effort to better understand the origin of these outbreaks typing of outbreak-related isolates has been conducted by multiple viral gene sequencing. The construction of a data bank of viral sequences from vaccine strains, backyard flock isolates, broiler and breeder isolates let to the differentiation of viral strains and the identification of gene sites that can be utilized as makers to trace isolates in the field.

9:00—9:15 AM

Characterization of a Glycoprotein C Mutant of Infectious Laryngotracheitis

Calvin L. Keeler, Jr., University of Delaware
Co-Authors: William M. Schnitzlein, Andrew E. Shaffer, and Deoki N. Tripathy

Infectious laryngotracheitis (ILT) causes an acute upper respiratory infection in chickens. In this study the infectious laryngotracheitis virus (ILTV) glycoprotein C (gC) gene has been deleted from the standard challenge strain of ILTV and replaced by a b-galactosidase expression cassette. This mutant virus has been studied both in SPF chickens and in commercial broiler birds to determine its pathogenicity and its ability to confer protection against a virulent ILTV challenge. The ILTV gC mutant was found to offer protection levels similar to those seen with chicken embryo origin vaccines and with the mild pathogenicity associated with tissue culture origin vaccines.

9:15—9:30 AM

Quantitative Profile of *Mycoplasma gallisepticum* Interaction with the Chicken Tracheal Mucosa in Vaccine Strains and Field Isolates

Sharon Levisohn, Kimron Veterinary Institute, Israel
Co-Authors: Inna Lysnyansky, Shmuel Perl, and David Yogev

Mycoplasma gallisepticum (MG) strains differ markedly in their ability to colonize and spread within a flock, as well as in the ability to spread to the lower respiratory tract with consequent transmission to progeny. Early events occurring on the tracheal mucosa are critical for the outcome of infection, such as ability to persist, spread in the flock and elicit a serological response. Live MG vaccines and strains with marked host proclivity, such as the "finch MG", are currently relevant examples of such differences. Our study attempts to correlate adherence in laboratory models and expression of cytadherence proteins with tracheal levels of MG, host immune response and quantitative changes in the tracheal mucosa, comparing a panel of MG strains differing in their biological properties.

BREAK 9:30—10:00 AM

Session A, Wednesday, July 20, 2005 **Moderator: Dr. Stan Kleven**

10:00—10:15 AM

The Interference of a Non-Pathogenic Avian Mycoplasma Species with *Mycoplasma gallisepticum* (MG) Infection and Diagnosis

Naola M. Ferguson, The University of Georgia
Co-Authors: Victoria A. Leiting, Ziv Raviv, Ruth S. Wooten, and Stanley H. Kleven

The overgrowth of rapidly growing non-pathogenic mycoplasma species can often interfere with cultivation of *Mycoplasma gallisepticum* (MG) from clinical samples in the laboratory. Infection with non-pathogenic mycoplasmas may also negatively impact MG growth and infection *in vivo*. In this study the effect of *Mycoplasma gallinaceum* (a non-pathogenic avian mycoplasma species) infection on MG populations in the trachea and MG detection by culture and PCR are evaluated.

10:15—10:30 AM

Case Report: *Mycoplasma gallisepticum* in Red and Gold Pheasants

Donna Kelly, Georgia Poultry Laboratory Network

Within a period of four months, four different premises presented Red and Gold Pheasants to the Georgia Poultry Laboratory Network with the complaint of mortality, foamy eyes, and gurgling noises. Upon examination, the pheasants had swollen sinuses, foamy eyes or pasted eyelids, and were making gurgling to raspy sounds while breathing. All pheasants presented were young females, three to four months of age. Females in the flocks were more affected than the males. The flocks were PCR and serology positve for *Mycoplasma gallisepticum*, however isolation attempts only yielded *M. gallinaceum.* A brief epidemiological investigation revealed that all birds originated from a common supplier, although three premises purchased their birds from an auction. A follow-up flock profile will also be presented.

10:30—10:45 AM

Epidemiological Incidence of Field Strains of *Mycoplasma gallisepticum* and *Mycoplasma synoviae* isolated from Broiler Breeders and Broilers in Colombia

Hugo Moscoso, The University of Georgia
Co-Authors: Jaime A. Ruiz, Ivan R. Alvarado, John R. Glisson, and Charles L. Hofacre

Broiler breeder flocks and their progeny experiencing mild to severe respiratory disease were monitored for *Mycoplasma gallisepticum* (MG) and *Mycoplasma synoviae* (MS). Samples were collected on FTA® cards and analyzed by PCR using ms *vlha, mg c2* and 16S rRNA primers. The presence of field strains of MG and MS was confirmed in susceptible flocks. Specific aspects related to the clinical cases in both breeders and broilers, interaction between *Mycoplasma* prevalence and treatment strategies of the identified strains will be presented.

10:45—11:00 AM

Mycoplasma synoviae Control in Multi-aged Broiler Breeder Farm using Antibiotics Therapy: Case Report

Young-ho Hong, Sam-Hwa breeding Agri., Inc., , Republic of Korea
Co-Authors: Jisun Kwon, Hyunjeong Lee, and Changseon Song

Mycoplasma synoviae (MS) is a common respiratory pathogen in poultry farms in South Korea. Eradication of MS in broiler breeder flocks is important to decrease the economic losses caused by MS associated and dependent poultry diseases. Broiler breeder flocks raised in A-type cage system was infected with MS between December 2002 and January 2003. The MS positive farm has 6 houses and can hold total 60,000 birds. Three flocks with 20,000 birds have been moved to 2 houses at the age of 10 to 14 weeks of age with 3 to 4 month interval every year. Each house was washed out and disinfected before birds movements. Tilmicosin and Chlortetracycline were intensively used to reduce the MS shedding in MS positive flocks, and MS infection was monitored monthly by MS type specific PCR assay using trachea swabs and feather samples. The possibility of MS control using antibiotic therapy and MS environment monitoring will be discussed.

11:00—11:15 AM

Mycoplasma gallisepticum in Commercial Layers

Sherrill Davison, University of Pennsylvan
Co-Authors: Stanley H. Kleven, Eric N. Gingerich, Maricarmen Garcia, Perry L. Habecker, and Robert J. Eckroade

Isolation and characterization of the causative strain(s) of MG is often difficult due to overgrowth of non-pathogenic mycoplasmas during culture attempts. To eliminate this problem, Dr. Stanley Kleven suggested the novel approach of a bioassay using sentinel turkeys. Turkeys which are highly susceptible to pathogenic MGs, act as “filters” for the MG when commingled with MG infected layers. The turkeys are cultured for MG rather than the chickens.

Fifteen trials were conducted using the new isolation approach and MG was successfully cultured in approximately 50% of the trials. Two “ts-ll-like”, and five “wild” type MGs were isolated. An additional isolate was able to be typed as MG and failed to grow in further cultures.

One “ts-11-like” MG and two “wild” type MGs that had been identified by RAPD and GTC were used in the pathogenicity trials in layers and turkeys. The pathogenicity of the isolates was evaluated by clinical signs, air sac score, and tracheal mucosal thickness. The “ts-11-like” strain demonstrated minimal pathogenicity relative to the negative (no challenge) and positive (R strain) control groups. The two “wild” types demonstrated a greater degree of pathogenicity over the “ts-11-like” strain in every measured parameter including clinical signs of infection, airsacculitis, and tracheitis.

This research identified MG organisms affecting commercial layers and defined their pathogenicity. The results of the pathogenicity trials will be utilized as a baseline for MG vaccine protection evaluations. Preliminary evaluation of MG vaccines will also be presented

11:15—11:30 AM

Hemagglutinin Serovars of *Avibacterium [Haemophilus] paragallinarum*: Typing, Cross-protection and Virulence

Edgardo Soriano V., Centro de Investigación y Estudios Avanzados en Salud Animal, México.

Avibacterium [Haemophilus] paragallinarum is the etiological agent of infectious coryza. Currently, are recognized nine hemagglutinin serovars of this bacterium. The ERIC-PCR was used for identifying clonal relationships between field-isolated strains. However, hemagglutinin serotyping of isolates is better suitable for understanding possible vaccine failures. Differences on the protection were observed. Based on results and a knowledge of the global serovar distribution, most poultry regions of the world would be best served by an inactivated infectious coryza vaccine containing reference strains of serovars A-1, B-1, and C-2. Also, differences on virulence were assessed by pathogenicity studies of the nine reference strains. These results will help guide on the prevention and control of infectious coryza.

11:30—11:45 AM

Oligonucleotides Containing CpG Motifs (CpG-ODN) as a Vaccine Adjuvant in Poultry

Susantha Gomis, Western College of Veterinary Medicine
Co-Authors: Lome Babiuk, Andrew Potter, and Brenda Allan

Synthetic oligonucleotides (ODN) containing CpG motifs (CpG-ODN) have been shown to be effective immunoprotective agents in murine models. The objective of this study was to investigate the effect of CpG-ODN as an adjuvant in a killed *E. coli* vaccine in poultry. Birds were vaccinated with killed *E. coli* antigens with either 10 or 50 µg of CpG-ODN on day 10 and 20. The control group of birds was vaccinated with killed *E. coli* antigens with oil in water emulsion or saline. At day 30 a virulent isolate of *E. coli* was applied on a scratch site on the caudal abdominal region. Birds were examined for 10 days post *E. coli* challenge and pathological and bacteriological assessment were conducted on all dead or euthanized birds. The *E. coli* vaccine group that received no CpG-ODN had a survival rate of 65%. In contrast, groups that received the vaccine plus CpG-ODN had significantly higher survival rates ($p<0.01$). This study demonstrated CpG-ODN as an effective vaccine adjuvant in poultry.

11:45—12:00 PM

Enhancing DNA Vaccine-Induced Production of Hemagglutinin-specific Reference Antisera

Jennifer Pfeiffer, Southeast Poultry Research Laboratory, USDA, ARS
Co-Author: David L. Suarez

The goal was to find an adjuvant which could enhance hemagglutinin-specific antisera production. The pCI expression vector containing the hemagglutinin gene of an H5 or an H7 influenza virus was used. Coadministered with these plasmids was either different cytokines including chicken IFN type 1 gene and IL-10 or CpG oligodeoxynucleotides. Different cationic lipids were also compared. Birds were vaccinated at four weeks of age, boostered once, and bled at two-week intervals, beginning two weeks after initial vaccination. Initially, the IFN groups showed higher titers than other groups. Current work is still being done to further assess these results.

ADJOURN

Session B, Wednesday, July 20, 2005 **Moderator: Dr. Pedro Villegas**

8:00—8:15 AM

Functional Characterization and Phylogenetic Comparison of the Chicken Toll-like Receptor 7

Darrell R. Kapczynski, USDA-ARS-SEPRL
Co-Authors: Victoria J. Philbin, Adrian L. Smith, and Peter S. Holt

Toll-like receptor (TLR) family members are responsible for recognizing the presence of invading microorganisms through pathogen-associated molecular patterns and thereby induce innate immune responses. Recently, several chicken TLR's have been identified, including TLR7, which is reported to be involved with recognition of ribonucleic acid components characteristic of viral genomes (e.g. ssRNA). In this study, we compared the innate immune response of the avian macrophage cell line, HD11 (TLR7+), to the TLR7 agonist Loxoribine, as well as live and killed Newcastle disease virus. In addition, the phylogenetic relationship of various TLR7's from avian origin will be discussed.

8:15—8:30 AM

Intestine Organ Culture Passaged Infectious bronchitis virus Strains: Effect on Specific Pathogen Free Chickens

Ivan Alvarado, The University of Georgia
Co-Author: Pedro Villegas

The effect of the intestine organ culture passaged (IP) Arkansas and Massachusetts IBV strains was evaluated in 1 day-old specific pathogen free chickens. Compared with the original non-passaged strain, the IP-Ark strain induced milder lesions in the upper respiratory tract. No significant differences in the effect on the upper respiratory tract were observed between the IP-Mass strain and a commercial Massachusetts vaccine. The results indicated that additional passages should be performed to decrease the pathogenicity of these potential IBV vaccine strains.

8:30—8:45 AM

Development of a Lateral-flow Immunoassay for the Detection of IBV Antigen

John El-Attrache, Texas A&M University
Co-Author: Jaime Thurk

The principal objective of this project was to design, develop and construct a lateral-flow immunoassay (LFI) that could be utilized to detect IBV antigen in both the laboratory and field. Data generated in this study suggests that an inexpensive (< $0.10 in material cost per strip) and reliable LFI can be further developed and utilized for the detection of the most common IBV serotypes. In addition, a multitude of formats could be applied to detect and differentiate the major economic poultry respiratory viruses such as IB, AI and ND on the same LFI.

Session B, Wednesday, July 20, 2005

8:45—9:00 AM

Efficiency of Recombinant IBV DNA Vaccine in ovo with Interferon Enhancement

Mazhar I. Khan, University of Connecticut
Co-Author: Jaroslaw J. Fabis

Induction and activation of the interferon system represents the first line of defense against viral diseases and possibly other infectious agents. Released interferon circulates in the body, activating immune responses through direct binding to the surrounding cells, and indirectly by influencing the release of a myriad of chemokines and cytokines. It stimulates innate responses as well as acquired responses. It activates the cells' interferon systems and puts them in an antiviral state. In our study, interferon is being used as an enhancer of the vaccine and should not have a direct influence on the resistance against IBV infection, since it will be introduced one time *in-ovo* injection with the IBV DNA vaccine and the challenge study will be perform after 4 weeks post inoculation.

Experimental vaccine protection trial data will be presented using interferon type 1 as an adjuvant with IBV DNA vaccine *in-ovo*.

9:00—9:15 AM

Effect of Viremia and Antibody Status on Tumor Incidence, Tumor Spectrum, and Viral Distribution in Different Tissues of ALV J Infected Meat Type Chickens

Arun Kumar R. Pandiri, USDA-ARS Avian Disease and Oncology Laboratory
Co-Authors: Willie M. Reed, and Aly M. Fadly

Infection of meat type chickens with ALV J can result in any of the following infection status (V+A+, V+A-, V-A+ and V-A-). The effect of the viremia (V) and antibody (A) status on tumor incidence, tumor spectrum, mortality and tissue distribution of the virus is described. Chickens that were able to develop antibodies against the virus (V+A+, V-A+) had lower incidence of tumors and had a limited tumor spectrum that those that fail to develop antibodies. This was especially remarkable in those chickens with antibodies capable of clearing viremia (V-A+). The effect of ALV J infection status on distribution of the virus as well as the proviral genome in different tissues is also evaluated.

Session B, Wednesday, July 20, 2005

9:15—9:30 AM .

Evaluation of Response of a New Experimental Line of Chickens (line 0-1) to Avian Leukosis Virus Infection

Jody K Mays, USDA, ARS, Avian Disease and Oncology Laboratory
Co-Authors: Henry Hunt, Arun Pandiri, Larry Bacon, and Aly Fadly

We previously reported the development of a new chicken line (line 0-1) by mating the original ADOL line 0 to a commercial layer lacking endogenous viral genes (Bacon et al. Avian Pathol. 2004: 33:233-243). In the present study, we compared the response of chickens from line 0-1 with chickens of the original line 0 following infection with strain RAV-1 of subgroup A avian leukosis virus (ALV-A) and strain ADOL Hc-1 of ALV-J at hatch. At 5, 8, 12, and 16 weeks of age chickens were tested for viremia and neutralizing antibody. The cytotoxic T-cell (CTL) response against ALV-J was also measured in both lines. No significant differences in viremia and antibody responses between line 0-1 and line 0 chickens were noted following infection with ADOL Hc-1. However, line 0-1 and line 0 chickens differed in their RAV-1 antibody response. At 5 weeks of age, 11/13 (85%) of line 0-1 chickens produced neutralizing antibody, compared with 4/12 (33%) of line 0 chickens. By 12 weeks of age, the majority of line 0-1 and line 0 chickens had cleared the virus and were producing neutralizing antibody. Also, no significant differences were noted in tumor response between line 0-1 and line 0 chickens following RAV-1 infection. In addition, the CTL response was comparable between the two lines. These characteristics indicate that line 0-1 is suitable for use in research and diagnosis of ALV.

BREAK 9:30—10:00 AM

Session B, Wednesday, July 20, 2005 **Moderator: Dr. Y. M. Saif**

10:00—10:15 AM

Comparative Evaluation of the Pathogenicity of an Extraneous Subgroup A Avian Leukosis Virus Isolated from Commercial Marek's Disease Vaccines

Carolyn A. Davis, USDA-ARS Avian Disease and Oncology Laboratory
Co-Authors: Jody K. Mays , Arun R. Pandiri, and Aly M. Fadly

The pathogenicity of an extraneous subgroup A avian leukosis virus (ALV-A), isolated from commercial Marek's disease vaccines (Fadly et. al., Proc. USAHA; 2003; p 524-525) and termed B-39, was compared with that of Rous-associated virus-1 (RAV-1), the prototype strain of ALV-A. Viremia and cloacal shedding results suggest that chickens from both lines were equally susceptible to infection with either virus. The incidence of ALV-induced tumors in $15I_5$ X 7_1 chickens was significantly higher in chickens inoculated by RAV-1 than in those inoculated with B-39 isolate The data suggest that the oncogenicity of strain B-39 of ALV-A isolated from commercial Marek's disease vaccines is much lower than that of RAV-1, the prototype strain of ALV-A.

Session B, Wednesday, July 20, 2005

10:15—10:30 AM

The Emergence of New-type IBD Viruses in the United States and Comparisons to Delaware E in Vaccination/challenge Studies

Kalen Cookson, Fort Dodge Animal Health
Co-Authors: Daral Jackwood, and Joe Giambrone

At the 2004 AAAP Meeting, Daral Jackwood presented phylogenetic tree analysis of over 40 IBDV field viruses isolated predominantly from broiler farms suffering from various diseases. Sequencing analysis of the hypervariable region of VP2 placed these viruses into 5 family branches, including 4 variant branches and the classic branch. The Delaware E branch contained almost 30% of all samples, while 50% of the samples fell into a distinct branch (1). Vaccination/challenge data will be presented comparing Delaware E protection to at least two viruses in this family branch 1.

10:30—10:45 AM.

Evaluation of the Protection conferred by Coarse Spray Vaccination against Infectious bursal disease in Commercial Broilers

Alejandro Banda, Cornell University Duck Research Laboratory
Co-Authors: Pedro Villegas, and Francisco Perozo

Commercial broilers were divided into eleven groups of ten birds each. The birds were vaccinated in the drinking water or by coarse spray at different ages with a vaccine containing the 2512 strain of IBDV. At 28 days of age, the chickens were challenged with the Edgar strain. The results showed that both vaccination procedures elicited similar protection against challenge.

10:45—11:00 AM

Two Bursal, B-cell Subpopulations with Different Flow Cytometry Profiles following IBDV Infection

Daniel I. Petkov, The University of Georgia
Co-Authors: Erich G. Linnemann, Darrell R. Kapczynski, and Holly S. Sellers

Infectious bursal disease virus (IBDV) is a cause of immunodeficiency in chickens. In the bursa of Fabricius, IBDV causes a reduction of surface IgM^+ cells and follicular depletion. B-cell kinetics following IBDV vaccination and challenge was evaluated in the spleen and bursa with Bu1a/b, IgG, IgA, and IgM antibodies. Two B-cell subpopulations with different flow cytometry profile and kinetics were observed in the bursa. Subpopulation A, comprised of smaller IgM^+ cells, was not affected and subpopulation B, the larger IgM^+ cells, decreased after vaccination and challenge. The reduction of subpopulation B did not affect negatively the total serum IgA, IgG, and IgM immunoglobulins and IgG^+ and IgA^+ cells in the spleen. Subpopulation B, IgG^+ cells in non-vaccinated group increased after challenge. Subpopulation A, IgA^+ cells increased both after vaccination and challenge. Bursas were analyzed by immunohistochemistry for IgM^+ cells.

Session B, Wednesday, July 20, 2005

11:00—11:15 AM

Effect of Infectious Bursal Disease Virus on Macrophages

Jagdev M. Sharma, University of Minnesota
Co-Authors: Mahesk Khatri, Joe M. Palmquist, and Ra Mi Cha

We exposed specific-pathogen-free chickens to a virulent strain of IBDV and, at intervals, fractionated macrophage populations from the bursa and the spleen. During the first week of infection, the total number of macrophages in both organs was significantly lower than that in virus-free hatchmates ($P < 0.05$). Immune fluorescence and immunohistochemistry staining revealed the presence of viral proteins within macrophages, thus indicating the presence of replicating virus. Further, the residual macrophages in virus-exposed chickens were activated and had upregulation of iNOS and inflammatory cytokine transcripts. These results indicated that, in addition to B cells, macrophages may also serve as targets for IBDV replication and may play an active role in disseminating the virus to peripheral tissues and modulating viral pathogenesis.

11:15—11:30 AM

In ovo and Post-hatch Vaccination with a Live, Attenuated Variant Infectious Bursal Disease Virus

Steve Kass, University of Minnesota
Co-Authors: Mahesh Khatri, Ra Mi Cha and Jagdev Sharma

A virulent variant strain of infectious bursal disease virus (IBDV) was serially passaged in cells of an avian macrophage line (NCSU). The virus replicated in macrophages. Specific-pathogen-free chickens inoculated with the 13th serial passage of the virus developed mild bursal lesions, thus indicating that the virus had been attenuated. Preliminary data indicated that the attenuated virus induced protective immunity in chickens following *in ovo* or post-hatch inoculation.

Session B, Wednesday, July 20, 2005

11:30—11:45 AM

Comparative Pathogenesis of Infectious Bursal Disease Virus (IBDV) Challenge of Chickens after *in ovo* or Post Hatch Vaccination

Silke Rautenschlein, Clinic for Poultry, Veterinary School Hannover. Germany
Co-Author: Christine Haase

Most of the research regarding the pathogenesis of infectious bursal disease virus (IBDV) has focused on primary infection. We compared the pathogenesis of IBDV-challenge in chickens vaccinated either *in ovo* or post hatch with an intermediate IBDV vaccine. All vaccinated chickens were protected against challenge-induced morbidity, but not against challenge virus-replication. After challenge, IBDV-antigen was detectable at comparable levels in bursae of both vaccinated groups accompanied by an increased number of macrophages. Interestingly, *in ovo* vaccinated birds showed significant accumulation of intrabursal CD8+ cells after challenge while post hatch vaccinated did not. The difference in the T cell-response between vaccinated groups may explain the bursa lesion development after challenge only seen in the *in ovo* vaccinated birds.

11:45—12:00 PM

Role of Cellular Signaling Pathways in the Immunopathogenesis of Infectious Bursal Disease Virus

Mahesh Khatri, University of Minnesota
Co-Authors: Ra Mi Cha and Jagdev M. Sharma

Infectious bursal disease (IBD) is one of the most important viral diseases affecting the poultry industry worldwide. The IBD virus infects and destroys actively dividing IgM-bearing B cells in the bursa of Fabricius. Recently we have shown that infection with IBD virus also results in increased expression of the proinflammatory cytokines and iNOS in bursal and spleen macrophages of IBDV infected chickens. Viral infections can activate several signaling pathways including the protein kinase R pathway, mitogen-activated protein kinase (MAPK) pathways, and NF-*k*B, which are important in the expression of inflammatory cytokines. In this study, we examined whether IBD virus induces activation of p38 and NF*k*B in chicken macrophages. Inhibition of p38 MAPK and NF-*k*B by pharmacological inhibitors showed that expression of TNF and IL-1β, iNOS and NO production required activation of these signaling pathways. Our data show that, during the IBD virus infection of macrophages, activation of the p38 MAPK and NF*k*B pathway is associated with induction of inflammation.

ADJOURN

Poster Session
Monday, July 18 – Wednesday, July 20, 2005

Avian Influenza

PP1

Detection of Antibodies in Serum and Eggs and Virus Shedding in Eggs following Infection with an H6N2 Avian Influenza Virus

Darrell W. Trampel, Iowa State University
Co-Authors: En-Min Zhou, and Kyoung-Jin Yoon

Ten chickens in peak egg production were inoculated with H6N2 avian influenza virus (AIV) and five uninoculated chickens were kept as controls. Following inoculation, serum samples and eggs were collected weekly for 8 weeks and then monthly until 5 months had passed. Antibodies against AIV in serum and egg yolks were measured via AGID and ELISA tests and results were compared. Virus isolation and PCR on both albumen and egg yolks were attempted daily for 7 days and then weekly until 6 weeks after inoculation. H6N2 AIV was isolated from the albumen and egg yolk of one inoculated chicken at 4 days PI. The same egg was positive on the PCR test. Egg production from this chicken subsequently stopped.

PP2

Variation in the H6 Hemagglutinin Genes of Avian Influenza Viruses Collected from Wild Water-fowl and Shorebirds in North America 1969-2002

Erica Spackman, Southeast Poultry Research Lab, USDA-ARS

The Hemagglutinin (HA) genes of thirty-two H6 AIV isolates, collected from wild-aquatic birds in North America (NA) between 1969 and 2002 were sequenced and analyzed with all available H6 HA sequence. The sequences assorted into four major clades with no clear grouping by species, location, or year of isolation, indicating that multiple lineages co-circulate in aquatic birds. North American AIV isolates had between 72.7% and 99.6% identity, revealing greater than expected sequence variation. Importantly, numerous HA gene sequences from North American isolates grouped with “Eurasian” sequences, indicating that avian influenza viruses may be transferred from Europe to NA by wild birds.

PP3

Avian Influenza of Subtype H9N2 in Poultry of Lebanon: Immunity and Infection

Elie K. Barbour, American University of Beirut, Lebanon
Co-Authors: Vatche K. Sagherian, Samar Dankar

The Immunity, infection and performance during H9N2 Avian Influenza outbreak in intensively managed and in free range chicken layers and broilers are compared. The frequency of infectivity and failure to develop immunity in the differently managed layers and broilers differed significantly. This was associated with a difference in performance of the differently managed layers. The mortality rate and nature of the lesions in the broilers was significantly different than that of the layers. Infectivity by H9N2 in the central nervous system of layers and broilers was different. The correlation between the ELIZA titers in sera and in the yolk, and its relationship to Heamagglutination titers to H9N2 antigen is concluded.

PP4

Microarray Technology for Detection of Avian Influenza

Michele N. Maughan, University of Delaware
Co-Authors: Travis W. Bliss, David L. Suarez, and Calvin L. Keeler, Jr.

Avian influenza is an economically significant pathogen having great agricultural and public health consequences. Current detection methods are limited to either rapid detection without subtyping, or costly and time-consuming subtyping. Microarray "DNA chip" technology has great potential for use as a method to detect and identify influenza viruses. This paper reports the use of cDNA and oligonucleotide microarrays for the identification of the H5, H7 and H9 serotypes of avian influenza. Many factors involved in microarray development have been taken into consideration in the development of this technology: probe design, sample labeling spotting protocols, and hybridization conditions.

Bacteria, Miscellaneous

PP5

An Outbreak of Avian Tuberculosis in Chuckars

Dhillon, A. Singh, Washington State University
Co-Authors: Dennis M. Schaberg, Sylvia K. Weber, Fonda Wier, and Daina V. Bandli

An outbreak of avian tuberculosis was diagnosed in Chuckars. Four 1 ½ year old chukars were submitted for postmortem examination, with a history of a loss of 21 birds out of 200-breeder flock. No mortality was reported from adjoining flocks. The livers of three chukars were severely enlarged, hard in texture, and some areas were pale. The spleens of all chukars were enlarged and contained numerous pale white foci. The cecal wall , mesenteric attachments contained several raised focal areas.

The results of aerobic cultures performed were negative. The Composite tissues of liver and spleen were positive for Mycobacterium avium isolation. The isolated organism was also identified by PCR to be M. avium. Results of histopathology confirmed mycobacteriosis.

PP6

Identification of *Bordetella avium* by PCR and Analysis of Amplicon Sequence

Karen B. Register, USDA/ARS/National Animal Disease Center
Co-Author: Andrew G. Yersin

Despite increase use and superior performance of PCR assays in clinical laboratories, identification of *B. avium* still depends upon isolation and biochemical testing. A *B. avium*-specific PCR has previously been reported, but details critical to reproducing it are not provided and analytical verification was not carried out. We have developed a highly sensitive and specific *B. avium* PCR utilizing the previously described primer set. Sequence analysis of the amplicons generated from 72 *B. avium* isolates revealed occasional polymorphisms, one of which may be host-specific. The sequence data provides evidence for transmission of *B. avium* from wildlife to domesticated turkey flocks.

PP7

Efficacy of an Inactivated Pasteurella Vaccine for American Kestrels

Jennifer Echo, University of California-Davis
Co-Authors: Patricia Wakenell, and William Ferrier

Pasteurella multocida can be a devastating respiratory and systemic infection in both captive and wild raptors. We will present data from a preliminary study evaluating the efficacy of a killed polyvalent Pasteurella vaccine in kestrels. The kestrels were obtained both from a captive population maintained at Magill University, Montreal, Canada and wild caught. The kestrels were challenged with a virulent field isolate of Pasteurella and evaluation of efficacy was based on clinical signs, serology, bacterial isolation and postmortem examination.

PP8

Inflammatory Process in Commercial Broilers related to Skin Scratches Occurring in the Growing Period

M. Alfonso, North Carolina State University
Co-Authors: Bill Hewat, and H. John Barnes

In a previous study in commercial broilers the gross changes in skin scratches occurring within 6 days before processing were evaluated and correlated with inflammatory process (IP) in the carcasses. Although the characteristic subcutaneous caseous plaques were not found in these carcasses, the prevalence of IP increased with the age of the scratches. In the present study a total of 150 broilers from 3 commercial farms have been identified when showing fresh, naturally-occurring scratches at 5, 4, 3, 2, and 1 week before processing. Scratches are being monitored on a weekly basis. Individual carcasses will be traced until USDA inspection to determine the prevalence and severity of IP. (Project still in progress)

PP9

Otitis associated with *Salmonella arizonae* in Turkey Poults

H. L. Shivaprasad, University of California, Davis
Co-Author: P. Cortes

Neurological signs can be a result of lesions in the brain, spinal cord and/or ears. Otitis interna and media were found in ten turkey poults between 9 days and three weeks-old. Most of these birds had neurological signs, pale corneas and increased mortality in the flocks. In addition to otitis these birds also had meningoencephalomyelitis, ophthalmitis, omphalitis, hepatitis and enteritis. *S. arizonae* was isolated from the yolk sac, brain and eye of some of these birds. It is most probable that otitis interna was an extension of meningitis in these birds. Otitis due to *S. arizonae* has not been reported before.

PP10

Evaluation of Adjuvants and Route of Immunization for *Clostridium perfringens* Type A alpha toxoid Vaccine in Providing Passive Protection against Necrotic enteritis in Broiler chickens

Suzan Dimmick, Schering-Plough Animal Health Corp.
Co-Authors: Lindy Echtenkamp, Huchappa Jayappa, Joan Schrader, and Terri Wasmoen

The role of *Clostridium perfringens* Type A in the pathogenesis of necrotic enteritis has been firmly established. The vaccine containing C. perfringens Type A alpha toxoid was prepared with two different adjuvants. Pullets were immunized twice with one of the adjuvanted vaccines by either intramuscular or subcutaneous route. The progeny chicks were challenged with virulent C. perfringens Type A to determine passive protection. The results of the efficacy study will be discussed.

PP11

***Pasteurella multocida*: Serotypes from Mississippi Isolates**

Danny L. Magee, Mississippi State University

Mississippi isolates of *Pasteurella multocida* are routinely serotyped and occasionally fingerprinted. This retrospective study will examine the frequency and possible seasonality per serotype per production complex. For the fingerprinted isolates, consistency per serotype will be examined.

PP12

Use of Subtractive Hybridization to Detect Genomic Differences between Avian Pathogenic and Non-Pathogenic *Escherichia coli*

S. Kariyawasam, Iowa State University
Co-Authors: K. Siek, and L. K. Nolan

A PCR-based suppression subtractive hybridization (SSH) was used to determine the genomic differences between an avian pathogenic (APEC) (O1 serogroup) and an avian fecal (AFEC) *Escherichia coli* isolate that harbor a common set of virulence genes. Screening of the subtraction library yielded four fragments (HB1, HB2, HB3, and HB4) that were present only in APEC-O1. Nucleotide sequence of HB4 exhibited 99% homology with a region of a pathogenicity island of shiga toxin producing *E. coli* strain 4797/97. The other three sequences did not exhibit homology with any known genes.

To understand the distribution of fragments among APEC, AFEC, and uropathogenic *E. coli* (UPEC), 95 isolates of each group were screened by PCR. About 69%, 93% and 16% of APEC, AFEC and UPEC, respectively, possessed sequences corresponding to HB1 fragment. None of the AFEC isolates possessed HB2, HB3 or HB4 fragments. Interestingly, only one (~1%) APEC isolate was positive for HB2 or HB4 fragments, while the HB3 fragment was detected in 63% of APEC screened. None of the UPEC isolates contained HB4, whereas 15% of UPEC possessed HB2 and/or HB3.

Our results supported the idea of extensive gene diversity in *E. coli* associated with extraintestinal diseases. Besides, the presence of certain genome sequences unique to APEC-O1 in UPEC suggested potential zoonotic risk associated with APEC.

PP13

Comparative Genomics and Distribution of an R Plasmid, pAPEC-O2-R, among Avian *Escherichia coli* Isolates

Timothy J. Johnson, Iowa State University
Co-Authors: Kylie E. Siek, Sara J. Johnson, and Lisa K. Nolan

In this study, a 101-kb IncF plasmid from an avian pathogenic *Escherichia coli* (APEC) strain (APEC-O2) was sequenced and analyzed, providing the first complete sequence of an APEC plasmid. This plasmid, pAPEC-O2-R, encodes resistance to tetracycline, silver and other heavy metals, quaternary ammonium compounds, sulfonamides, aminoglycosides, chloramphenicol, trimethoprim, and beta-lactam antimicrobial agents. It is transmissible by conjugation to plasmid-less strains of APEC, uropathogenic *E. coli*, commensal *E. coli* of the feces apparently healthy birds (avian fecal *E. coli* or AFEC), and *Salmonella* spp. Analysis of its sequence revealed that it shares a common backbone with other IncF plasmids but that it contains a unique antimicrobial resistance region. These cassettes are located on mobile elements or are surrounded by them, and they are marked by differences in G+C content, suggesting that these plasmids are mosaic units, whose structure reflects a complex evolution. These plasmids also may be widely distributed among avian *E. coli*. When 451 APEC and 104 AFEC were assessed for antimicrobial resistances encoded by pAPEC-O2-like plasmids, resistances were found to be common among APEC but not among AFEC. These results suggest that R plasmids, encoding multidrug resistance, are common among avian *E. coli* and have the potential to act as a reservoir of resistance genes for other bacteria within the poultry environment.

General Diseases

PP14

Spinal Cord Histopathology in Lame Broiler Chickens

Frederic Hoerr, Auburn University
Co-Authors: Susan Williams, and Scott Westall

Broilers in numerous flocks developed lameness beginning at age one week and continuing until 40 days of age. Some was attributed to angular limb deformities and spondylolisthesis, but others showed paddling, splay leg, and recumbency. Spinal cord and vertebrae were examined histologically from broilers 17 and 31 days of age, respectively. Lesions included lymphocytic radiculoneuritis, and lymphocytic inflammation of small veins in and adjacent to the vertebral column, of the subarachnoid trabeculae, and vertebral periosteum. Multifocal lymphocytic infiltrates with mitotic figures occurred in kidney. Axonal degeneration occurred uncommonly in spinal chord. Peripheral nerve had no lesions. The cause is currently not known but the investigation continues and the all available information will be presented in the poster.

PP15

Microbiological Evaluation of Pekin Duck Baluts

Richard M. Fulton, Michigan State University

Baluts are an ethnic delicacy which consists of partially incubated embryonated eggs which have been incubated for sixteen to eighteen days. Baluts are boiled for 20 to 30 minutes and then eaten. In order to determine the microbiological risk of baluts prior to cooking, liver and intestine from embryos of these eggs were harvested and then cultured for routine bacteria as well as salmonella and Campylobacter.

PP16

Determining the Health Status of Migratory Passerines

Crystal D. Newcomer, The Ohio State University
Co-Authors: Teresa Y. Morishita, and Paul G. Rodewald

The health status of migratory passerines is relatively unknown. These birds travel long distances and have the ability to transport potential pathogens, such as bacteria and parasites to distant locations. In this study fecal samples were taken from approximately 6% of a sample of spring migrants that stopover near Lake Erie. The samples were tested for the prevalence of bacteria and parasites, and casualties were necropsied to determine cause of death. For each bird, the weight, subcutaneous fat content, age, and wing cord were determined to compare the health status of birds with bacterial infections versus birds without infections.

PP17

Survey of Poultry Disease Knowledge and Nutrition in Backyard Flock Owners

Lori Martin, The Ohio State University
Co-Authors: J. David Latshaw, and Teresa Y. Morishita

To develop effective veterinary medicine extension programs for backyard poultry flocks, it is necessary to understand the level of knowledge and perception regarding basic poultry diseases. To address this situation, we have developed a series of questions that would survey the current knowledge and perception of basic poultry diseases. The survey was distributed at national meeting to obtain participants over a regional area. One hundred surveys were distributed and the results will be displayed in a tabular format.

PP18

Vascular Lesions in Four-Year-Old Laying Hens

Oscar J. Fletcher, North Carolina State University
Co-Author: John Barnes

Microscopic evaluation was done on the reproductive organs from 371 four-year old laying hens. These hens had no gross lesions of neoplasia and were in active egg production. Arteriosclerosis characterized by mineral deposition was the most common lesion found and most often occurred in the smaller arteries located within the ovarian stroma. Atherosclerotic lesions were characterized by deposits of lipid in the subendothelial tissue and/or the muscle wall of large arteries located outside the ovary. Incidence and histologic characterization of these vascular lesions will be presented and described.

PP19

Systemic Aspergillosis in Broiler Chickens

Sue Ann Hubbard, Mississippi State University

Twenty-one day old broiler chickens from a south Mississippi integrator were submitted for high mortality. Birds were being raised on old litter. Postmortem lesions included lesions throughout the brain, proventriculus, heart, lungs, air sacs and eyes with edematous brains.

Collection of the heart and lungs revealed *Aspergillus fumigatus* growing on Sabouraud-Dextrose agar. Histopathology findings showed severe systemic mycotic granulomatous inflammatory disease with features compatible with *Aspergillus* species.

PP20

Dermal Melanosis in Broiler Chickens

Rocio Crespo, CAHFS – Fresno, University of California-Davis
Co-Author: Manuel Pizarro

This paper describes a case of gray to black pigmentation of the subcutaneous tissue and fat of the abdomen, and blueish pigmentation of the shanks observed in chickens at slaughter. Around 2% of the birds were condemned. Histopathology revealed accumulation of melanin in these tissues. No significant bacteria were isolated. This condition is known as dermal melanosis (DM), a congenital defect due to a recessive gene. It consists of accumulation of melanin in the abdominal fat. Although DM is not harmful to people, it may cause severe economic losses to the producer.

PP21

Immunohistochemistry in a Case of Mycotoxicosis in Red Partridges

Rocio Crespo, CAHFS – Fresno, University of California-Davis
Co-Authors: Manuel Pizarro, and Maria Castaño

Immunohistochemical staining with PAP anticytokeratin and antiKi-67 were used to investigate the effects of aflatoxin B1 and T-2 on liver, lung, and kidney of partridges. PAP showed strong positive immunoreaction in the epithelial cells of hepatic bile ducts, as well as bronchial and atrial epithelium of lung. Hepatocytes, pulmonary blood and air capillaries, and kidney were negative by PAP. These results suggest differences in the cytoskeleton. All the tissues were negative to the antibody antiKi-67; even the nuclei of epithelial cells in mitosis. This was unexpected as the reaction to Ki-67 is highly positive in dividing nuclei of mammalian cells.

PP22

Pathology of Older Laying Hens

H. John Barnes, North Carolina State University
Co-Authors: Luisa Adochiles, Donna K. Carver, and Gustavo C. Rodriguez

The pathology in 2274 laying hens between 2-4 years of age that were necropsied during a study on chemoprevention of ovarian cancer will be described by system. Emphasis will be on lesions of the reproductive tract, which included developmental, inflammatory, and neoplastic disorders. Lesions in the musculoskeletal, digestive, and urinary system were less common than those in the reproductive system, but still frequently occurred. Systems in which occasional lesions were seen included the integumentary, special senses, cardiovascular, and hemopoietic systems. Lesions were rarely identified in either the respiratory or endocrine systems. The nervous system was not evaluated.

Immunology, Immunity and Vaccines

PP23

Immunogenicity and Safety of a Novel Avian Herpesvirus Vaccine

Joan S. Schrader, Schering-Plough Animal Health
Co-Authors: Stephanie Cook, Gary Petersen, Dianna Jerman, Linda Gergen, and Terri Wasmoen

A novel avian herpesvirus has been created using recombinant DNA technology for protection of chickens against Marek's disease, and as a vector for expression of other poultry disease antigens. The virus has been tested for protection against Marek's disease using the USDA challenge model, for safety at a 10X dose, and for reversion to virulence following backpassage in chickens. Results will be presented. These studies have confirmed the efficacy and safety of this novel vaccine.

PP24

Avian Macrophage Transcriptome Responses to Bacterial Stimuli

Travis W. Bliss, University of Delaware
Co-Author: Calvin L. Keeler, Jr.

Macrophages are a first line of defense against invading pathogens and form the link between innate and adaptive immunity. Macrophages act by ingesting pathogens by phagocytosis, processing them, and presenting antigens to effector cells while simultaneously releasing compounds which stimulate a proper immune response. Thus, the response of macrophages to pathogens is an important area of study. Little work has been accomplished in this area in the avian species, however. This project examines the transcriptome response of avian macrophages to various bacterial stimuli using a 5,000-element avian macrophage microarray. This elucidated many genes involved in macrophage activation and immune regulation.

Infectious Bronchitis Virus

PP25

Anti-virus Functions of Halamine Fabrics: Potential Application for SARS Prevention

Ingrid Edwards, University of California-Davis
Co-Authors: Patricia Wakenell, and Gang Sun

Viruses such as severe acute respiratory syndrome (SARS), flu and poultry flu are major causes of respiratory diseases in recent years. Current infection control measures are still insufficient to prevent the spread of these coronaviruses in future outbreaks, thus the development of antivirus fabrics for medical uses is critical for disease prevention. Three durable and regenerable biocidal fabrics possessing different halamine structures were tested for their ability to kill coronaviruses using virus isolation of avian infectious bronchitis virus (IBV) in developing chick embryos as an indication of viral activity. The fabrics were tested in five trials for their ability to inactivate virulent and vaccine strains of Mass 41 IBV, either directly after applying the finishing treatment or after vigorously washing and recharging the fabrics to test durability and regeneration potential. IBV is a good model for SARS-associated coronavirus (SARS-CoV) because it is closely related to SARS-CoV, produces a disease in chickens similar to SARS and exhibits similar sensitivity to disinfectants. All three treatments, before and after washing, successfully inactivated IBV and therefore should show strong activity against SARS-CoV. The results will be discussed in this presentation.

PP26

Longitudinal Field Studies of Avian Respiratory Viruses in Broilers using Type Specific Real-time RT-PCR Assays

Hyun-Jeong Lee, Konkuk University, Korea
Co-Authors: Ji-Sun Kown, Ho-Sik Yoon, Yong-Ho Hong, and Chang-Seon Song

Respiratory diseases caused by avian respiratory viruses often cause serious economic losses in broiler industry. Real-time RT-PCR assays are fast and useful diagnostic tools for these kinds of complicated respiratory diseases. TaqMan probe was used to identify the respiratory pathogens and SYBR-Green was used to differentiate the virus subtype. More than 12 broiler flocks were swabbed every 3 days for the life of the flock. The swabs were analyzed by real-time RT-PCR assays, specific for infectious bronchitis virus, avian pneumovirus, avian influenza virus and Newcastle disease virus. The major cause of respiratory disease and epidemiology of avian respiratory viruses in broiler flocks will be discussed.

PP27

Serological Reactivity of Baculovirus-expressed Infectious Bronchitis Virus Nucleoprotein

Vikram N. Vakharia, University of Maryland Biotechnology Institute
Co-Authors: Chinta Lamichhane, and Gerard E. Edwards

We have cloned and expressed the infectious bronchitis virus (IBV) nucleoprotein (NP) gene using a baculovirus expression system. The baculovirus-expressed NP product (with His-tag) was purified through affinity chromatography using nickel columns. This protein will be used to develop an indirect ELISA test for diagnosis of IBV positive sera.

PP28

Correlation of airsacculitis Condemnation Rates and IBV ELISA and HI Serology Titers in Broiler Flocks from Mississippi

C. Gabriel Senties-Cué, Mississippi State University
Co-Authors: Danny L. Magee, and Robert W. Wills

Airsacculitis is one of the main causes of condemnations of broiler carcasses at slaughter plants. Infectious bronchitis is a prevalent respiratory disease which may cause increase of condemnations due to airsacculitis. This study will present the correlation of airsacculitis condemnation rates and IBV ELISA and HI serology titers in broiler flocks from Mississippi.

PP29

Evolutionary Trends in the Group III Avian Coronaviruses

Mark W. Jackwood, The University of Georgia
Co-Author: Deborah A. Hilt

Generally, coronaviruses are divided into three antigenic groups and tend to be highly species specific. For the most part, group III coronaviruses, which consist of infectious bronchitis virus (IBV) and turkey coronavirus (TCoV) only affect birds. However, we also know that coronaviruses can switch species specificity by altering their genetic makeup through a viral replication mechanism called template switching. The abrupt emergence of the severe respiratory syndrome coronavirus (SARS-CoV) has stimulated new interest in the consequences of this method of replication and sequence similarities of the SARS-CoV with IBV and other coronaviruses has lead to key questions regarding mutation rates and the overall history of coronaviral evolution. We will present recent sequence data for the group III coronaviruses and compare that to data available in GenBank in an attempt to elucidate the mutation rates and evolutionary trends for this group of viruses.

Infectious Bursal Disease

PP30

Characterization of an Infectious Bursal Disease Virus Isolated from Broilers in Ontario

Teresa N. Cereno, Merial Canada, Inc.

An Infectious Bursal Disease Virus (IBDV) isolated from 14 days old broilers was characterized and classified using RT-PCR-RFLP and gene sequencing of the VP2 hypervariable region. The virus isolate was propagated, titrated and was given as a challenge to 14 day old chicks. Bursal tissues were collected for bursa:body weight ratio determination and histopathology scoring. Results will be presented.

PP31

Comparison of Two Spray Vaccination Methods against Infectious Bursal Disease Virus in Broilers

Linda B. Purvis, The University of Georgia
Co-Authors: Pedro Villegas, and Alejandro Banda

Commercial broilers were vaccinated against infectious bursal disease virus by coarse spray vaccination at one and ten days of age. At one day of age, one group was vaccinated using a cabinet while a second group was vaccinated using a portable sprayer. Both groups were revaccinated at ten days of age with the portable sprayer. At four weeks of age, the birds were challenged with the Edgar strain. Data of bursal development, histological lesions and serology was analyzed. No differences were observed between the two methods tested.

PP32

Effect of Fixation Conditions on Immun-histochemistry of IBDV Infected Bursae

Mohamed M. Hamoud, The University of Georgia
Co-Authors: Pedro Villegas, and Susan M. Williams

Different fixation conditions of tissues infected with IBDV had a significant effect on success of extraction of genomic material from these formalin fixed paraffin embedded tissues. The effect of different pH levels, temperatures, concentrations of formalin, and fixation durations on the immuno-histochemistry detection of IBDV in infected Bursa of Fabricius is being studied, to optimize conditions for successful detection of IBDV in formalin fixed paraffin embedded tissues.

PP33

Efficacy of Two Vaccination Programs Containing 2512 IBDV Strains against Experimental Infection with F25/70 Strain in Broiler Chickens

Mónica Alba Chincha, San Marcos University Lima – Perú
Co-Authors: Eliana Icochea, Pablo Reyna, Rosa Gonzalez, and Claudia Perez

In this study were compared two vaccination programs against infection bursal disease in broilers. 321 Ross 308 broilers one day old were divided in three groups of 107 birds. The first group was vaccinated twice with an intermediate – intermediate commercial vaccine, the second group was vaccinated once with an intermediate-strong strain vaccine, the third group was unnvaccinated. All groups were challenged at day 32 with F 52/70 strain. Were registered gross and histologic lesion of bursa, serological response and productive parameters.

PP34

Study of in ovo Administered Antigen-Antibody Complex Vaccine of IBDV against Challenge F52/70 Strain in Broiler Chickens

Eliana Icochea D'rrigo, San Marcos University Lima – Perú
Co-Authors: Mónica Alba, Pablo Reyna, Rosa Gonzalez, Susana Friborg, and Jhon Guzman

The objective of this study was to evaluated the effect of in ovo vaccination against infection Bursal disease using an antigen-antibody complex commercial vaccine in broilers. 450 broilers Cobb Vantress one day old were divided in three groups: Group A vaccinated at 9 days and 19 days with two commercial live vaccines containing Lukert and 2512 strains, respectively. Group B vaccinated in ovo with the antigen-antibody complex at 18 days of incubation and Group C unvaccinated. All groups were challenged with F52/70 IBDV strain. Blood samples were collected from each groups at 1,7,14,28,35,42 and 47 days old to determine antibody level by ELISA test. Twelve chicks from each group were sacrificed weekly to examine gross and histopathological lesions, and bursal index.

Laryngotracheitis

PP35

Isolation and Molecular Characterization of Virulent Infectious Laryngotracheitis Virus from Commercial Layer Hens in Brazil

Jorge Luis Chacón Villanueva, Universidade de São Paulo. Brasil
Co-Authors: Paulo Eduardo Brandão, Laura Yaneth, Villarreal Buitrago, Antonio Jose Piantino Ferreira

Infectious Laryngotracheitis Virus (ILTV) causes outbreaks of respiratory disease with high mortality in chickens worldwide. From the end of 2002 through the beginning of 2003, an outbreak characterized by acute respiratory signs and high mortality occurred in non-vaccinated commercial layer hens in an intensive production unit with high hen population density in Bastos, Southeastern Brazil. The clinical signs included dyspnea, gasping, coughing and expectoration of bloody exudates, reduced egg production and high mortality. From tracheas, lungs and eyelids ILTV has been detected and isolated and next characterized based on genes p32, gE and TK. These results confirm the presence of ILTV and allow the determination of the virus strain that circulates among Brazilian flocks.

Leukosis

PP36

Pathogenicity and Transmission of a Field Isolate of Reticuloendotheliosis Virus

Taylor Barbosa, The University of Georgia
Co-Authors: Guillermo Zavala, Sunny Cheng, Maricarmen García, and Susan M. Williams

The pathogenicity and transmission of a field isolate of reticuloendotheliosis virus (REV) was studied using an experimental model in Japanese quail (JQ). The original REV was isolated from Attwater Prairie Chickens (*Tympanuchus cupido)*. The *gag* and *env* genes were partially sequenced and examined phylogenetically. The pathogenicity of the REV isolate was examined after inoculations in JQ embryos. The transmissibility of the REV isolate was studied in young JQ placed in contact with experimentally infected quail. This inexpensive *in vivo* research model may be used for further REV pathogenicity studies.

PP37

The Genome of Reticuloendotheliosis Virus integrated in the Genome of Fowlpox Virus

Pratik Singh, University of Illinois
Co-Authors: William M. Schnitzlein, and Deoki N. Tripathy

Field strains of fowlpox virus (FPV) comprise of an integrated reticuloendotheliosis provirus (REV) between the ORFs 201 and 203 in their genome. During FPV replication a heterogeneous virus population is generated comprising of FPV with either the long terminal repeats(LTRs) or the provirus. The provirus genome is 7989 bp long and like other retroviruses, is organized as gag, pol, env regions with the flanking LTRs integrated into the genome of FPV. Only the envelope gene region shows similarity to REV-A strain, while the remainder of provirus sequence shows homology to the spleen necrosis virus of REV group. While the 5' LTR sequence is near full length, the 3' LTR sequence is truncated.

PP38

Detection of Avian Leukosis Virus Subgroup J from Broilers and Broiler Breeders in Alabama: 1998-2004

Lanqing Li, Alabama Department of Agriculture and Industries
Frederic J. Hoerr, and Michael J. Luther

In the late 1990's myeloid leukosis caused by subgroup J avian leukosis virus (ALV-J) emerged in meat-type chickens. From 1998 to 2004, 2,699 samples were collected from broilers and broiler breeders in Alabama. Based on the PCR (Virus Research. 54:87-98.1998) using primarily liver as the test sample, a total of 1,765 samples (34.6%) were positive for ALV-J. The positive percentage was 44% in 1998 but declined to 11.5% in 2004. In 1998, seven integrators in Alabama had positive flocks but by 2004 only one had positives. The most positives (64.9%) occurred in 12- to 14-week-old chickens. The genomic sequence from different samples will be compared.

Miscellaneous Virus

PP39

Evaluation of Pathogenicity of Avianpox Viruses from Endangered Hawaiian Forest Birds

Deoki N. Tripathy, University of Illinois - Urbana-Champaign
Co-Authors: Taejoong Kim

Two avianpox viruses, Hawaiian goosepox (HGP) and Palilapox (PaP), isolated from endangered Hawaiian forest birds were tested for their immunologiccal and biological relationship to each other and to fowlpox virus (FPV).

Susceptible chickens were immunized with each of the viruses and their pathogenicity as well protection against fowlpox virus challenge was compared. Both HGP and PaP revealed low pathogenicity for chickens and did not provide protection against FPV. Although initial humoral immune responses measured by ELISA were low in HGP and PaP-immunized chickens, challenge with either HGP, PaP or FPV enhanced the immune responses. These studies indicate that both Hawaiian pox viruses are biologically different

PP40

Identification of Turkey Astrovirus and Coronavirus Co-infections in Brazil

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Co-Authors:Mario Sergio Assayag Junior, Paulo Eduardo Brandão, Jorge Luis Chacón Villanueva, Claudete Serrano Astolfi Ferreira, Nelva Grando, Ricardo Soncini, Marcelo Pereira, and Antonio Jose Piantino Ferreira

Turkey astroviruses (TAstV) and turkey coronavirus (TCoV), enterotropic viruses with worldwide distribution associated to the PEMS (Poultry Enteric and Mortality Syndrome), have been surveyed in 12 turkey flocks located in Southern Brazil by PCR to the RNA-polymerase RNA-dependent gene and to the 3'UTR region of these viruses, respectively. Seven out of 12 samples were positive to TAstV, 7 to TCoV and 7co-infections have been found. This is the first description of TAstV and TCoV in turkey flocks in South America. These findings correlate with the symptoms and are useful in preventing new outbreaks.

PP41

Molecular Characterization of turkey Astroviruses circulating in the United States

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Co-Authors: Erica Spackman

This study investigated the genetic diversity of turkey astroviruses (TAstV's) collected from turkey flocks during the years 2003 and 2004. A comparative analysis was performed with isolates of TAstV's detected in intestinal contents from flocks with enteritis or healthy flocks from different regions of the United States. The samples were screened for TAstV using real time RT-PCR for the highly conserved polymerase gene. Genetic analysis of TAstV positive samples was performed by partial sequence analysis of both the polymerase and capsid genes. Great variability in the capsid gene was present in the samples studied, and distinct clades were observed by phylogenetic analysis. The polymerase gene was more conserved.

PP42

Avian Hepatitis E Virus and Flax as risk factors associated with Hepatitis-splenitis Syndrome in Commercial Laying Hens

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Co-Authors: Bruce Hunter, Stanley Wayne Martin, Dongwan Yoo, Sameh Youseff, and Brian Binnington

A large commercial layer chicken flock that was fed flax experienced increased mortality when the birds reached 37 weeks. The average weekly mortality was 0.34% over a 20 wk period with peak mortality of 0.9% for 1 week. The gross and histological lesions were confined to the liver and spleen. A second flock also experienced high mortality with similar clinical signs and lesions. Both flocks were fed with 11% full-fat flax diet beginning at 28 weeks to produce omega-3 enhanced designer eggs. Reduced feed consumption, reduced body weight gain and poor peak production were noticed prior to the onset of increased mortality. A total of 245 birds were necropsied and 78% of these had lesions in the liver and spleen. 44% were consistent with hepatitis splenitis syndrome (HSS) with lesions ranging from acute periportal lymphoplasmacytic hepatitis to chronic severe necrotizing cholangiohepatitis with hemorrhage, vasculitis and amyloidosis. 11% of the birds had lesions of fatty liver hemorrhage syndrome (FLHS) and 22% had combined lesions of HSS and FLHS. No significant bacteria or virus recovered from samples of the liver/bile and spleen. 11 out of 21 bile samples of birds tested were positive to avian Hepatitis E virus RNA using RT-PCR. Using simple linear regression model and population average models, there was a significant increase in mortality in birds that were fed with flax. Other risk factors identified were age of the bird and breed.

Mycoplasma

PP43

Status of the ORT, ART, IB, ND, AI (H9N2), MS and MG Infection in Broiler Breeder Flocks in Iran

Seyed Medhi Mirsalimi, Iran
Co-Author: Omid Rahimzadeh

To find out the status of the broiler breeder folks (BBf) regarding the presence of the above mentioned pathogens and their possible effects on the poor performances a study has been conducted to find out the level of infection at various ages (10, 20 and 35-40 weeks of age). The country was divided into seven regions and from each region 2 flocks of each 3 designated age group were chosen for blood sampling. Thirty blood samples from each flock were taken and seromonitoring by ELISA regarding the above mentioned pathogens were performed. The result has been shown that almost in all flocks there are evidences of presence of one or more of the above pathogens in all flocks were tested. More details of the study and the effect of these infections on the performance will be discussed.

PP44

Tissue Responses of SPF Chickens exposed to Live *Mycoplasma gallisepticum* (MG) Vaccines and other MG Strains

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Lesions were scored (0 = no lesion; 0.5; 1.0; 2.0 and 3.0) on tracheas of necropsied SPF chickens, exposed twice to *Mycoplasma gallisepticum* (MG) vaccines (F, TS11 and 6/85) and low virulent MG strain. At 14 days post first exposure ($P1^{st}E$), except MG-F, the low virulent strain groups, differed from control, being the highest score (1.2) obtained for both MG-TS11 and 6/85. At 35 days $P1^{st}E$, the highest legion score was registered for both MG-F and TS11. After challenge at 63 days $P1^{st}E$, the lesion scores decreased significantly, indicating that tissue changes are important to protection.

PP45

Hematological Values on *Mycoplasma synoviae* Experimental Infection

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Hematological values on MS infection, were investigated on SPF chicks. Monocytosis was present 7-28 days post infection (dpi). The differences observed (infected times control birds) were seen at 28 dpi by reduction on erythrocyte numbers (1.7; 2.0 x 10^6/mm), and on mean globular hemoglobin concentration (29.6%; 31.0%), with an increase on mean globular values (147.6 fl; 114.6 fl), suggestive of regenerative anemia. At 7dpi it was observed lymphocytosis (66.4% e 28.3%) and reduction on heterophils (24.6% 65.3%). These findings suggests that immune affected birds went through acute an chronic disease stages.

PP46

Evaluation of DNA Extraction Methods for *Mycoplasma gallisepticum* PCR

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DNA extraction methods for *Mycoplasma gallisepticum* (MG) were evaluated for recovery in PCR reactions. Samples were collected both individually and pooled from layers infected both by challenge or chronic field infection. Extraction methods used included boiling, a commercial DNA extraction kit, and an indicating FTA card. Preliminary results suggest commercial extraction kit and pooling of samples were the most sensitive for detecting MG infection in chronically infected birds.

PP47

The Effect of *Mycoplasma synoviae* (MS) Challenge at the Onset of Lay on Performance of Table Egg Layers

Ziv Raviv, The University of Georgia
Co-Author S. H. Kleven

The question whether *Mycoplasma synoviae* (MS) infection has a role in laying hen morbidity, mortality and lower egg production is still a debate. There are field impressions that laying flocks come down with peritonitis mortality, and decreased egg production simultaneously with the point in time when they turn seropositive for MS. Our aim is to simulate a commercial situation under controlled experimental conditions, and to measure the effect of a virulent MS strain challenge on an MS free egg layers at the onset of lay. We will try to determine whether MS plays any significant role in the overall performance of laying operations.

Newcastle

PP48

Quantification of Newcastle Disease Virus by Real-Time RT-PCR

Patti Miller, Souteast Poultry Research Lab, USDA
Co-Authors: Daniel J. King, and David L. Suarez

Outbreaks of Newcastle disease virus (NDV) cause economic losses to the poultry industry. Currently, titers for NDV isolates are calculated by titrating viral samples in embryonated chicken eggs (ECE), which is time consuming and costly. Recently, a real-time RT-PCR-based assay has been developed and validated for the rapid diagnosis of NDV. The goal of this study was to determine if this RRT-PCR assay could be used to quantify viral load in a sample. Using a comparison of viral titrations in ECE and the RRT-PCR assay for 5 different NDV isolates, we demonstrated a correlation between RRT-PCR and viral titration in quantifying viral load.

PP49

Comparison of the Enzyme Linked Immunosorbent Assay and the Hemagglutination Inhibition Test for Antibody to Newcastle Disease in a Commercial Farm and Non-commercial Layers Raised in the Backyard of Poor Families from Argentina

Celina Buscaglia, Universidad Nacional de La Plata y Comisión de Investigaciones Científicas de la Porvincia de Buenos Aires, Argentina
Co-Authors: Gabriela Prada, Verónica Prio, Graciela Prio Lofeudo

A commercial Newcastle Disease Virus (NDV) ELISA and the HI test were performed to serum samples for the detection of NDV antibodies. The layers belong to a social program called "Pro-Huerta" in which chickens are given to poor families At the same time sera from a commercial layer farm were obtained. Since Argentina has been declared free of velogenic NDV with vaccination in 1997 and back-yard birds can be a potential source of the virus, this study was not only to check for the presence of antibodies, but also to compare the results obtained between the ELISA and the HI tests. Due to the economic situation of the country, the possibility of running an ELISA as was done in previous years is somehow complicated and the HI could be another way of helping sanitary controls.

PP50

Protection of Chickens from Newcastle Disease with a Recombinant Baculovirus Subunit Vaccine Expressing the Newcastle Disease Virus Fusion and Hemagglutinin-Neuraminidase Protein

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Co-Authors: Haan-Woo Sung, Jun-Gu Choi, Eun-Kyoung Lee, Jae-Hong Kim, Chang-Seon Song

Recombinant baculoviruses containing the fusion (F) and hemagglutinin-neuraminidase (HN) glycoprotein gene of the velogenic viscerotropic (vv) and lentogenic strains of Newcastle disease virus (NDV) were constructed to develop an effective subunit marker vaccine. Protection was evaluated by challenge with one of Korean vvNDV, Kr-005/00. The combined rNDF+HN glycoprotein derived from velogenic strain induced complete protection on clinical signs and mortality as well as significantly reduced the virus shedding after single immunization. These data indicate that the combined rNDF+HN glycoprotein can be used as an ideal subunit marker vaccine candidate when ND eradication program will be launched in the future.

Parasitic Diseases

PP51

Fecal Oocyst Counts as a Dynamic Tool to Monitor Coccidiosis in Broilers

Miguel Ruano, Perdue Farms, Inc.
Co-Authors: Bruce N. Stewart-Brown, Douglas K. Marvil, and Henry M. Engster

A good correlation between fecal oocyst counts and intestinal lesions as determined by the Johnson and Reid lesion-scoring method was found when running field cocci-checks (gross and microscopic scores) coupled with fecal analysis. In vaccinated birds under experimental conditions, fecal oocyst counts performed at 2, 3 and 4 weeks of age had a high correlation with gross and microscopic scores performed on the day of challenge and seven days after challenge, at 3 and 4 weeks of age, respectively. Subsequent fecal analysis during the growout cycle proved to provide a simple, economical, and dynamic system that can be adopted to monitor the cycling of coccidiosis in either vaccinated or non-vaccinated flocks.

PP52

Comparative Study of Performance Between Different Anticoccidial Drug Programs and a Vaccine Coccidiosis Control Program

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Co-Authors: Tim Cherry, Chris D. Knight, Julia J. Dibner, and Steve Mueller

This poster will summarize five consecutive field trials comparing different anticoccidial drug programs against a coccidiosis vaccination program in the same premises. It will also discuss the improvement in performance in the subsequent two flocks after the five consecutive grow-outs using a coccidiosis vaccine in the same houses as result of shifting the oocyst population to a drug sensitive population.

Pneumovirus

PP53

Optimization of a Diagnostic RT-PCR for Avian Pneumoviruses in Specimens collected on FTA® Cards

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Co-Authors: Darrell R. Kapczynski, Hugo Moscoso, Gloria Avellaneda, and Charles L. Hofacre

Avian pneumovirus infections cause TRT and swollen head syndrome in broilers and turkeys. The virus can be very difficult to isolate with only small number of laboratories around the world that are successful in virus isolation. Molecular diagnostics can not only diagnose the presence of the virus but can also differentiate the 3 subtypes (A, B or C). We will determine the feasibility of using FTA cards for inactivation and import of avian pneumovirus samples into the USA. Isolates of serotype A, B, and C will be spotted onto the cards and held at various temperatures and times to determine stability under the many environmental conditions these cards maybe exposed to in mailing to the US.

RT-PCR for avian pneumovirus will be optimized using the most appropriate sets of primers in terms of specificity and sensitivity of the test for samples submitted on FTA filter paper. Amplified product will be analyzed by nucleotide sequencing to further characterize the subclasses.

PP54

Immunopathogenesis of Avian Pneumovirus in Turkeys

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We compared the immunopathogenesis of avian pneumovirus (APV) at several stages of attenuation. Two-week-old turkeys were inoculated with APV/MN/Ia/1997 at Vero cell passage levels 41 (APV41), 50 (APV50) and 63 (APV63). At 1, 3, 5 and 7 days post inoculation (dpi), turkeys were examined for a) clinical signs, b) lesions in the upper respiratory tract (URT), c) presence of viral genome in the choanal swabs and d) cytokine production by spleen cells. In addition, at 5 and 7 dpi, spleen cells were examined for mitogenesis and at 14 and 21 dpi, serum samples were examined for APV-specific antibodies. None of the viruses produced progressive clinical signs , however, all viruses induced an antibody response. APV41 and APV50 induced histological lesions and could be readily detected in the URT by PCR. Choanal swabs obtained from turkeys exposed to 10,000 $TCID_{50}$ but not from those exposed to 2,000 $TCID_{50}$ of APV63 were positive for viral genome. APV63 did not induce detectable histological lesions in the URT. APV41 and APV50 caused a profound inhibition of mitogenic response of spleen cells whereas APV63 caused a modest inhibition. APV-induced mitogenic inhibition was not noted if spleen cells were depleted of macrophages.

Toxins

PP55

The Environmental Fate of Arsenic in 3-Nitro ®

Simon M. Shane, North Carolina State University (ADJUNCT)

Roxarsone (3-Nitro®) has been administered to broilers for 5 decades. In 2003 a weighted mean addition rate of 42 ppm was used in 63% and 52% of US starter and finisher feed respectively. Each broiler ingests and excretes 100 mg 3-Nitro contributing to a litter arsenic value of 15 ppm. The compound is rapidly bio-degraded in soil to pentavalent arsenic in the arsenate (AsO_4^{3-}) form. This is complexed to iron oxides with levels of 7 ppm arsenic in soils receiving 2-4 tons litter/annum. Leaching of arsenic to groundwater progresses over decades with soil water levels of 5 ppb As(V) compared to the new EPA upper tolerance of 10 ppb. Current geochemical studies do not indicate an environmental problem from continued use of 3-Nitro.

PP56

A Case of Intoxication with Carbamates in Wild Geese

Elisabeta G. Bianu, Institute for Diagnosis and Animal Health, Bucharest, Romania
Co-Author: Daniela A. Nica

Several dead wild geese harvested by veterinarian body were sent to the laboratory for toxicological investigations. 80 birds died during two days in the delta of the Danube river in Romania. The case happened in the sowing period. They seemed to eat treated grains in the field. The content of the gizzard and muscular stomach were analyzed. An acid extraction followed by an hexan extraction were performed. The sample was injected in GC-MS system. A toxic carbamate compound was identified and quantified.

PP57

A Case of Acute Intoxication with Arsenic in Poultry

Daniela A. Nica, Institute for Diagnosis and Animal Health, Bucharest, Romania
Co-Author: Elisabeta G. Bianu

In a day the owner of an individual farm found all his hens dead. To establish the cause of the death he sent six poultry for toxicological investigations. The pathological exam showed: intense inflammation of the proventriculus gizzard, horny epithelial layer of the gizzard separated from the underlying muscle, pale and friable liver. Using atomic absorbtion spectrometry we determinated arsenic in gizzard content, liver and kidney. The concentrations of this element were much higher than normal values, so death of the poultry was an acute intoxication with arsenic.