

The Chick Papers

A Monthly Newsletter from the Georgia Poultry Laboratory



July 2014

Intranuclear Inclusions in Kidneys, Pancreases, and Livers from Broiler Chickens Infected with Fowl Adenovirus Type-10 and Type-7

By Dr. James Davis

Adenoviruses will cause Inclusion Body Hepatitis (IBH) and pancreatic necrosis in chickens (1). Adenoviruses have also been reported to cause glomerulonephritis in broiler chickens with Inclusion Body Hepatitis (2). Intranuclear inclusions have been described in kidneys of a Common Murre (3), and Psittacine birds (4), and in chicken kidney cell cultures infected with avian adenovirus (5). However, adenovirus-associated intranuclear inclusions have rarely been reported in kidneys of chickens.

Between the Spring of 2013 to January of 2014, 9 groups of broiler chickens from 4 different commercial broiler-producing companies, 21-28-days-of-age, were submitted to the Georgia Poultry Laboratory. The primary complaint was elevated mortality in the flocks.

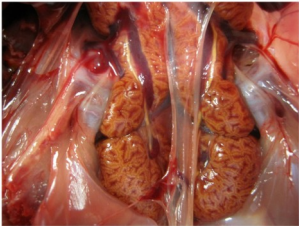


Figure 3: Kidneys with adenoviral inclusion bodies

Each group contained at least 1 bird which had gross liver lesions consistent with those caused by adenoviruses (Inclusion Body Hepatitis) (1) (Figures 1 & 2). Four groups also contained birds with pancreatic atrophy, grossly, and 5 groups contained birds with enlarged, gold to bronze-colored kidneys (Fig.3).

Using primary chick embryo kidney cell cultures, Fowl Adenovirus Type-10 was isolated from 8 of the groups and Type-7 was isolated from 1 group. The viruses were isolated from 8 pools of livers, 6 pools of pancreases, and 4 pools of kidneys. Genotypes were determined using PCR technology with product sequences determined by the Georgia Genomic Facility,

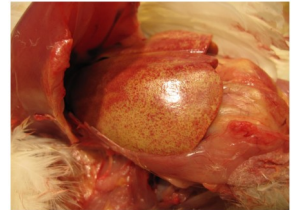


Figure 1: Liver with IBH

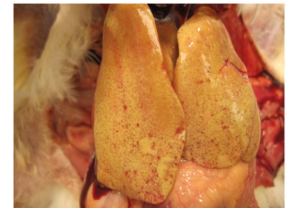


Figure 2: Liver with IBH

Histologically, livers exhibited multifocal to regional necrosis with intranuclear inclusions scattered in hepatocytes in 8 groups. Pancreases from 6 groups exhibited multifocal acinar cell necrosis with intralesional intranuclear inclusions and varying numbers of lymphoid nodules. Kidneys from 4 groups exhibited multifocal proliferative glomerulopathy with intranuclear inclusions in some tubular epithelial cells. Figures 4, 5, & 6 are examples of these lesions.

A total of 3 birds were ataxic when examined. These birds were found to be hypoglycemic (whole blood glucose levels of: 59 mg/dl, <20 mg/dl, and <20 mg/dl), using a hand-held glucose meter (Freestyle, Abbott Labs, Alameda, CA 94502). The pancreases of these 3 birds were severely atrophied and necrotic histologically. Therefore, the etiology of the hypoglycemia was determined to be due to pancreatic insufficiency.

Conclusion: Fowl adenovirus infections can be responsible for damage to multiple organs in broiler chickens. Therefore, if Inclusion Body Hepatitis is suspected in a bird, multiple organs should be collected for both histopathology and virology.

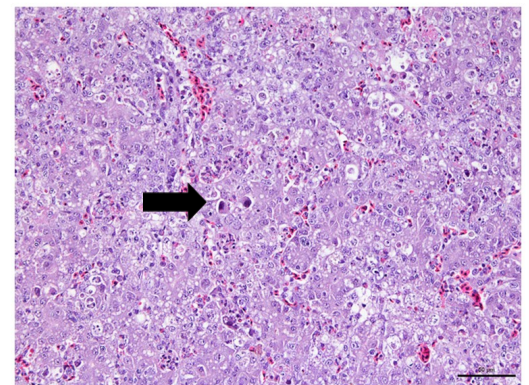


Figure 4: Intranuclear inclusion bodies in liver

The New Laboratory Construction:

The building is progressing very well. The drywall is almost installed and finished for paint. First coat paint is being applied. Ceiling tiles are going in and the ceiling in the BSL-3 is complete. Windows are almost complete should finish next week. We are starting the floor prep and cove base, should finish by late August. A/C is running on automatic working well.



Current Construction in late July 2014



Tours and Visitors:

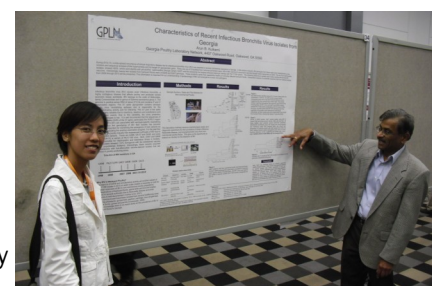
- **USDA Intern Visits the Oakwood Lab :** On July 22-23, Stuart Cofield an intern from USDA /APHIS Veterinary Services visited the lab for observation and some field sample collection exercises. Stuart is a fourth year student at Virginia Tech School of Veterinary Medicine and is very interested in becoming a food safety epidemiologist.
- **UGA Poultry Science Student Visits GPLN:** Rachel Harrison, a Poultry Science /Avian Biology student visited all departments of the laboratory. Rachel was introduced to the basics of how samples are received, processed, tested and results analyzed. She hopes to get into vet school after the completion of her B.S. degree in Poultry Science.
- **Indonesian Professors Tour GPLN:** On July 22, Dr. Widya Asmara and Dr. Michael Haryadi Wibowo were given a tour of all departments followed by a discussion with Dr. Louise Dufour-Zavala on the Georgia Poultry Industry. The group was hosted by Dr. Claudio Alfonso from the USDA Southeastern Poultry Research Laboratory in Athens.



GPLN in Discussion with Indonesian Visitors
(l-r) Dr. Wibowo, Dr. Louise Dufour-Zavala (GPLN) and Dr. Asmara

GPLN Events:

- **GPLN Staff Attend the American Veterinary Medical Associations (AVMA) Meetings in "The Mile High City".** From July 25–29, GPLN staff presented posters and made oral presentations at the Association of Avian Pathologists (AAP) annual meeting in Denver, Colorado. Poster and oral presentations were made Brenda Glidewell, Selena York, Dr. Louise-Dufour-Zavala, Dr. James Davis, Dr. Louise Dufour-Zavala, Dr. Doug Anderson, Len Chappell: On July 26, Dr. Louise Dufour-Zavala presented "Biosecurity and Surveillance in the Control of Respiratory Disease" to the AAP Symposium combined audience exceeding 300 attendees.
- **Georgia Delegation Attends 42nd NPIP Biennial Conference in Charlotte, NC:** Dr. Bernie Beckman (Hy-Line), Dr. Dan Wilson (Rose Acre Farms), Dr. John Smith (Fieldale Farms), James Brantley (GPLN), Jessi Kimbrell, Gijs Schimmel (Centurion), Brenda Glidewell, Nick Hodgson (Cobb), Dr. Doug Waltman, Dennis Hughes (United Egg Marketing), Ben Johnson, Dr. Marty Ewing (Sanderson Farms), Len Chappell, Dr. Raul Otalora (Quail International), Dr. Doug Anderson (GPLN)



Dr. Kulkarni (right) Discusses Poster with AVMA/AAP Convention Attendee



Georgia Delegation at NPIP 42nd Biennial Conference



AVMA/AAP Presenters in Denver, Colorado
(l-r) Brenda Glidewell, Dr. James Davis, Len Chappell, Dr. Louise Dufour-Zavala, Selena York, Dr. Doug Anderson

GPLN Employees

- **Mycoplasma Lab Has New Technician:** In July, Weini Araya joined the Mycoplasma PCR Team. GPLN welcomes her to this high throughput division of the Virology Dept. Weini's duties will include sample extraction & PCR protocols of extracted template. Weini is a recent graduate of Lanier Tech Medical Laboratory Technicians Program. She is a native of Eritrea (East Africa) and has lived in the States for 6 1/2 years.
- **Tifton Lab Reduces Activity, Effective August 1,** This newsletter would not be complete without a word about the services of the Tifton staff and their contribution to the overall health of the Georgia flocks and the poultry industry. These professionals will be greatly missed by all at GPLN and the south Georgia customers. Thanks to Zakia Wilson, Kristina Ashton, MaryKay Hall, and Tavoris Wallace for dedication and service to GPLN. Dr. Anderson will continue to receive sick birds at the Tifton Lab; therefore, customers will need to contact him in advance before bringing birds to the lab. Lastly, to the Tifton staff, thanks for the wonderful memories!.



Weini Araya