

The NCVDLS REPORT



Accredited by the American Association of Veterinary Laboratory Diagnosticians

Veterinary News and Information From North Carolina's Diagnostic Laboratories

From The Director by David T. Marshall, DVM

Another busy quarter has elapsed since our last newsletter. The past three months have delivered the assorted accomplishments and challenges we have come to expect. I've come to appreciate, with the passing months, the skills and dedication of our work force, and the valuable service that they provide our clients, both the animal agriculture industries and companion animal owners alike.

Accomplishments this period include the completion and signing of our Quality Manual and supporting Tier II SOP documents, outlining broad quality procedures for every aspect of laboratory activities, including quality control, record keeping, client communications, equipment validation and maintenance, and proficiency testing. We are pleased that Ms. Katheryn Schmidt came on board in October as a Quality Assurance Assistant, bringing a vast wealth of experience in this arena from both the private and public sector. Katheryn will also serve as the division's Safety Officer and continue to expand our currently ongoing safety procedures.

In September, the Western Diagnostic Laboratory in Arden became the second satellite facility to be up and running with our new Laboratory Information Management System (LIMS). Clients utilizing that facility now have the ability to track real time results and retrieve reports through the secure web-based format, after registering. We hope to have the LIMS system fully implemented in the remaining two branch labs by the end of the year. Further information about the system from Herman Honeycutt, our NCVDLS Applications Analyst Programmer, can be found in the Client Corner section of this newsletter.

We are pleased to announce the filling of two of our vacant pathologist positions. Dr. Tahseen Aziz began employment on October 17 as the avian pathologist. Dr. Aziz comes to us with extensive background in the commercial poultry industry, both within the U.S. and internationally. He received his M.S. and Ph.D. in pathology from Iowa State University where he was a student of Dr. John Barnes, currently on staff at the NCSU-College of Veterinary Medicine. He has hands-on experience in the recognition and diagnosis of foreign and endemic avian diseases, and will be a valuable addition to our veterinary staff. Dr. Steven Rushton was selected to fill one of our two vacant mammalian pathologist positions. Steven continues to serve after 5.5 years on the Rollins Laboratory staff as a Veterinary Diagnostician as he pursues his Board certification. He received his D.V.M. from Kansas State University, and in CY2003 completed a four year residency in Anatomic Pathology from the NCSU-CVM. Dr. Rushton formally assumed his pathologist duties on October 1 and will strengthen our pathology services. A national search continues to fill our remaining pathologist vacancy, which we hope to have filled by the end of the year. Thank you for your past and continued patience as we continue to work to fill these positions. I would also like to thank Drs. Linda Kooistra, Laddie Munger, and Martha Hanes for their part time work during the interim, and also Dr. Oscar Fletcher at the CVM for providing avian histopathology slide analysis over the past four months. Several of these agreements will continue until our staff is at full speed.

On August 17, our newly created Diagnostic Laboratory Advisory Committee (DLAC) had its inaugural meeting in Raleigh. This group of 15 members represents all facets of the stakeholders that we serve, as well as many allied agencies and organizations with direct impact on our future. They will be integral in charting the future of the system during these turbulent times, and have already provided valuable input and direction to upper management. A list of the members and their affiliations follow this introduction. Many thanks to these individuals for dedicating their time to serve.

The major topic addressed by the DLAC was the inclusion within the recently passed Senate Bill 622 that charges the Office of State Budget and Management (OSBM) to develop a plan to consolidate



North Carolina Department of Agriculture and Consumer Services
Steve Troxler, Commissioner

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NCVDLS-Rollins Lab
1031 Mail Service Center
Raleigh, NC 27699-1031
Phone: (919) 733-3986
Fax: (919) 733-0454
Web site: www.ncvdl.com

Please e-mail NCVDL@ncmail.net with any comments and/or suggestions concerning The NCVDLS Report

Holiday Hours...

Veteran's Day-November 11
Thanksgiving-Nov. 24 & 25
Christmas-Dec. 23 & 26

Our laboratories will be closed on the above listed days. Happy Holidays!



From the Director (continued)

the NCDA&CS Veterinary Diagnostic Labs, the State Lab of Public Health (SLPH), and the SBI crime laboratory. The OSBM will contract with an independent consultant to develop this plan and provide a report to the General Assembly no later than May 1, 2006, and shall consider measures to eliminate duplicative services and privatize functions that can be more efficiently performed by non-state entities. Obviously, we do not support this concept, and have already met with the other potentially impacted agencies who share our concerns. We anticipate this study to be comprehensive and involve detailed cost analyses of all of our services and activities. We will keep you posted on the developments of this study over the next six months. I would be interested in your comments and feedback, which can be sent to me at david.marshall@ncmail.net.

I previously mentioned in last quarter's newsletter a departmental effort to secure funding from the General Assembly for an expansion and renovation of the Rollins facility to address the space limitations and enable the expansion of services. Alas, though promising and included within the House version of the budget, the request failed at the eleventh hour in conference and was not funded this session. Despite the setback, we were able to better educate members of the General Assembly as to our needs and the importance of what we do, and will push forward the effort in next year's session.

Finally, I would like to congratulate Diane Pearson, Faye Coombs, and Mary Horne as the inaugural recipients of our newly created Employee of the Quarter Award. These three employees, of our histopathology section, were recognized for their quality slide preparation and special staining skills, efficiency, work ethic, and cheery attitudes. They are truly a credit to our system and a pleasure to work with.

Regards,

David Marshall, DVM

Diagnostic Laboratory Advisory Committee

Dr. Jim Floyd	NCSU- College of Veterinary Medicine
Mr. Larry Wooten	N.C. Farm Bureau
Dr. Richard Kirkman	Private Veterinary Practitioner
Dr. Gene Erickson	NCDA&CS Veterinary Diagnostic Laboratory System
Dr. Rick Sharpton	Perdue, Inc
Dr. Shannon Jennings	Carroll's Foods
Dr. Leslie Wolf	DHHS- State Public Health Laboratory
Dr. Karen Post	NCDA&CS Veterinary Diagnostic Laboratory System
Dr. Eric Gonder	Goldsboro Milling
Dr. Mary Ann McBride	NCDA&CS Veterinary Division
Mr. Jeff Turner	Murphy Brown, L.L.C.
Dr. Randy Jones	Livestock Veterinary Services
Dr. Jennifer Haugland	NCDA&CS Veterinary Diagnostic Laboratory System
Dr. Gene Nemechek	GIS-Hog Slats
Dr. David Marshall	NCDA&CS Veterinary Division



Client Corner

Service Fee Increases by Dr. Karen Post

In lieu of additional cuts in appropriated funding for the diagnostic laboratory system for the 2005-06 Fiscal Year, the North Carolina General Assembly approved fee revisions for selected laboratory services as follows:

1. Coggins tests for Equine Infectious Anemia will increase from \$4.00 to \$6.00 per test.
2. Companion animal histopathology biopsies will double to the new fee of \$30.00 per sample.
3. A processing fee of \$1.00 per sample for separation of serum from whole blood submitted for serologic assays (charges not to exceed \$5.00 per accession).

These charges became effective September 1, 2005 and clients were notified in advance by a letter.

We Want Your Feedback by Dr. Stacy Robinson

Recently, the North Carolina Veterinary Diagnostic Laboratory System has changed submittal forms. As a result, we have heard complaints from veterinarians because they feel the new forms are not “user friendly”. We want your feedback! Please be specific as to your likes and dislikes. If you have seen a submittal form from another diagnostic lab that you particularly like and find useful, we would like to know that information, too. Many diagnostic labs have their submittal forms online if you have not yet seen forms from other laboratories. Our submittal form is also available online at our website: www.ncvdl.com. Please email any comments that you have using the link on our website. We will carefully consider all comments in our effort to serve our clients better!

Thanks again,

The NCVDLs Veterinarians

Options for Carcass Disposal by Dr. Jennifer Haugland

We have received many questions regarding the legal and proper way to dispose of bovine or equine carcasses after the necropsy examination. As a rule, renderers will not pick up carcasses when the hide is not intact. So, what are the other alternatives for disposal of an opened carcass? Because we want to support your efforts to provide necropsy services, a very useful tool in herd medicine, we have done a little digging (no pun intended) to determine some possible solutions for disposal of a carcass that has been opened.

One of the most common questions is, “Can we legally bury an animal?” The answer is yes. The [North Carolina Statute 106-403](#) states that domesticated animals can be legally buried as long as they are buried to a depth of at least 3 feet and they are no closer than 300 feet from any flowing stream or public body of water. Other approved methods of disposal are incineration, rendering at a rendering plant, and disposal at a county landfill. The statute also states that disposal of a carcass must be done within 24 hours of knowledge of the death.

Incineration may be done on the farm, although typically it is difficult and expensive. Many county landfills will accept cattle and horse carcasses for disposal, but please call ahead before transporting the animal.



Options for Carcass Disposal (continued)

We recommend that owners of any domesticated animals have a plan in place for disposal of intact carcasses as well as opened carcasses. We encourage you to discuss with your clients the NCVDLS after hours and holiday necropsy policy so that plans for necropsy and disposal can be made ahead of time. In some situations, the loss of the animal can be stressful and therefore difficult for the owners to make decisions. If the decision making process has already been put in place by a previous discussion with their veterinarian, owners will be grateful to not have to do much after the loss of their favorite horse.

An on-call veterinarian is available at each laboratory (phone numbers are listed at end of newsletter) to answer questions regarding field necropsies. The NCVDLS strongly believes in the value of field necropsy and quality sample submittal examinations as part of good herd health and herd management.

Recent Staff Changes? by **Herman Honeycutt**



If you are like most businesses, staffing changes occur every so often. To communicate those changes to Rollins Laboratory, we have included a Veterinary Information Update Form on our web site. Simply go to www.ncvdl.com and click on the NCVDL Forms link on the home page. There you will find the [Veterinary Information Update Form](#) beneath the Miscellaneous Forms category. The form contains room to list each practicing veterinarian at your business. Any changes in your mailing, billing or shipping addresses can be updated as well. There is also a space for your business e-mail address. Simply complete the form online and e-mail it to NCVDL@ncmail.net, or print the form and either fax or mail it to Rollins Laboratory. Keeping our database up-to-date avoids potential problems with case assignments, as well as account billing. So, if you have made any recent changes, please take a moment to complete the online form and send it to us so that we may better serve your veterinary needs.

Quality Assurance Update by **Lou Ann Risser**

The American Association of Veterinary Laboratory Diagnosticians (AAVLD) has changed the accreditation requirements for veterinary diagnostic laboratories. The requirements for accreditation closely resemble the guidelines from the Office International Des Epizooties, *OIE Quality Standard Guidelines for Veterinary Laboratories: Infectious Diseases*. As a result of these changes, the North Carolina Veterinary Diagnostic Laboratory System (NCVDLS) has established a Quality Assurance Department of which I, Lou Ann Risser, am the Quality Assurance Manager.

During my first year as the QA Manager, I have written the NCVDLS Quality Manual and the associated Quality Standard Operating Procedures (SOPs). The Quality Manual addresses the policies pertaining to the quality of various aspects of the laboratory. The sections in the Quality Manual address areas such as client communication, quality control, training, corrective and preventative actions, complaints, and many more such topics. The Quality SOPs define how to adhere and conform to these policies. The Quality Manual and the majority of Quality SOPs have undergone the review process and have the approval signatures of the Director and Assistant Director. The remainder of the SOPs is currently in the review stage and approval is expected in the coming weeks.

Training sessions will be conducted for the staff of NCVDLS prior to the roll-out and implementation of the Quality Manual and SOP. The policies set forth in the Quality Manual and adherence to the quality SOPs apply to all NCVDLS employees.



Quality Assurance Update (continued)

Each laboratory Department Supervisor has been assigned the difficult task of writing and compiling comprehensive procedures for each test method performed in their respective department. Each of these procedures will include detailed steps for the use and interpretation of quality control samples and/or standards. The final draft of these SOPs will be reviewed by the Quality Assurance Manager and approved by the Assistant Director.

Our primary goal is to ensure the quality and integrity of the tests performed at NCVDLS and to provide our clients with accurate and reliable results. Strict adherence to the quality policies and procedures will aid us in accomplishing our goal.

Interesting Field Cases by Dr. Stacy Robinson

We would like to give the veterinarians in private practice an opportunity to be a part of the NCVDLS Newsletter. Many of you see interesting cases on a day-to-day basis. We would like to include these cases in our newsletter. This will allow other veterinarians in private practice across the state, as well as the NCVDLS veterinarians, to learn from your case experiences. If you would like to submit a case, please contact Dr. Stacy Robinson at the Rollins Laboratory at (919) 733-3986. If we are unable to use a case in the upcoming newsletter issue due to the number of submittals, the case will be kept on file for a future edition. We are both excited and eager for your future contributions!



Excellent Web Site Source for Control of *Haemonchus contortus* in Small Ruminants

by Dr. Jennifer Haugland

Severe anemia from *Haemonchus contortus* parasitism is the most frequent cause for death in the goats and sheep submitted to NCVDLS. I recently found the web site for the Southern Consortium for Small Ruminant Parasite Control (www.scsrpc.org). This group of scientists, veterinarians, and extension agents are devoted to developing novel methods for sustainable control of gastrointestinal nematodes in small ruminants, and educating the stakeholders in the small ruminant industry on the most up-to-date methods and recommendations for control of gastrointestinal nematodes. This website contains many publications and presentations written by the members about innovative ways to control gastrointestinal nematodes. This informative website is also the place to order the FAMACHA [eye color charts](#). If you haven't heard, the FAMACHA system was compiled by veterinarians in South Africa, the National Wool Growers' Association, the UN, and several other groups. The basis of this system is to selectively deworm goats and sheep based on the color of the inside of the lower eyelid. According to the FAMACHA information guide, "selectively deworming only those animals that require treatment based on eye color score greatly decreases the development of resistance because the eggs produced by the few resistant worms that survive treatment will be greatly diluted by all the eggs produced by the animals that did not receive treatment. In contrast, where all animals are treated and moved to parasite-'safe', or 'clean' pasture, only resistant worms that survive treatment will produce all the eggs that form the next generation of worms." FAMACHA also recommends keeping records of the treatment of each animal since "both resistance (the ability to prevent or suppress infection) and resilience (the ability to withstand the effects of parasites) have been shown to be moderately heritable. This means that sheep and goats can be either culled or selected for these traits. In the long term, by culling animals that are repeatedly identified as unable to cope with moderate worm burdens, a more resistant and resilient flock, genetically suited to the environment can be bred." So, take a look at this web site and become informed with the most up-to-date and reviewed information available about gastrointestinal nematode control in small ruminants.



Necropsy Training Session by Dr. Jennifer Haugland

On August 6, 2005, the Rollins Laboratory offered a necropsy review session for large animal veterinarians. Six veterinarians and one wildlife biologist attended this session. The NCDA Cherry Research Farm in Goldsboro generously donated a Holstein cow for necropsy; and, at the last minute, we received a colt for those interested in diagnostic equine necropsies. Drs. Jennifer Haugland, Stacy Robinson, and Steven Rushton reviewed the most efficient and practical ways to open up a cow and horse in the field. Normal anatomy was reviewed, and the proper ways to harvest tissues for bacterial culture, formalin fixation, and for other laboratory tests were also discussed. Since neither animal had been euthanized that morning, we were able to point out how normal post-mortem autolysis appears. A slide show of gross pictures of common bovine and equine diseases was also presented. Attendees thought the brief review was very helpful, and many expressed the desire to attend another demonstration. Therefore, we will likely organize another large animal necropsy review session within the next 6 to 12 months. A companion animal necropsy review session is also being pursued. Information regarding future necropsy review sessions will be posted on the NCVDLs website. If you have any questions or would like to be put on the list of those interested in attending please call Dr. Jennifer Haugland at (919) 733-3986.



Employee of the Quarter



Congratulations!

Mary Horne

Faye Coombs

Diane Pearson

The North Carolina Veterinary Diagnostic Laboratory System's first Employee of the Quarter recognition was awarded to Diane Pearson, Faye Coombs, and Mary Horne. All of these employees are members of the histopathology section at the Rollins Laboratory. All three were awarded for the 2005 summer quarter for their combined dedication over many years. Diane has been at Rollins for 30 years, Faye has been here for 13 years, and Mary has been here 2 1/2 years. Not only are they dedicated to completing their tasks, but to performing them in the way that is accurate, efficient, and superb. Our pathologists have received many compliments from pathologists in other laboratories regarding their exceptional slide preparations. The amount of slides they cut and stain each day is impressive compared to the turnout of other histopathology labs. They take responsibility for their jobs, fixing any problems that may have occurred, and then take the necessary action to prevent similar errors. They also take great pride in the special stains, making sure they are done well. Diane, Faye, and Mary are a great support to the pathologists, helping them at any chance they can. They work to improve efficiency and implement new ideas. And after working long days, they are still the friendliest people in the laboratory. They have not only worked hard this past quarter, but also for the past several years, and have long deserved to be recognized.

Congratulations Diane, Faye, and Mary and thank you for your outstanding contributions!



Departmental News

ROLLINS LABORATORY:

Bacteriology... **Kirk Silas** has resigned from his position as Medical Laboratory Technician II to return to his home in Pennsylvania. The position, which entails the processing of clinical specimens and necropsy tissues, is in the process of being filled. **Sandy Murphy** attended a computer continuing education course on Microsoft Word I.

Histopathology... We are pleased to announce that we have two new pathologists! **Dr. Tahseen Abdul-Aziz** has been selected as our Avian Pathologist. He comes to us from British United Turkeys of America in West Virginia where he was Director of Veterinary Services for many years. **Dr. Steven Rushton** has been promoted to Mammalian Pathologist. Dr. Rushton completed his anatomic pathology residency at North Carolina State University College of Veterinary Medicine in 2003 and has served as a Veterinary Diagnostician at our laboratory for the past six years. Both pathologists assumed their new duties in October.

Immunohistochemistry (IHC)... Two new tests have recently been validated and added to enhance our in-house diagnostic test capabilities: Canine Parvovirus and *Neospora caninum*.

Molecular Biology... A new test is in the developmental stage for Infectious Bronchitis Virus (IBV) of poultry. The PCR test is now being offered on a limited basis until our internal validation process is complete.

Necropsy... We would also like to welcome back **Allison Heatherly** as one of our necropsy assistants, and extend warm greetings to **Erica Savage** and **Matthew Peddy**, both of whom were recently hired as necropsy assistants. In addition to their necropsy duties, they are also helping in the Histology Lab. All three assistants are full time students pursuing animal science degrees at North Carolina State University. Pre-veterinary student **Sara Dillon** has joined us as a histology aid to gain experience for her future in veterinary medicine.

Quality Assurance... **Katheryn Schmidt**, MT (ASCP) has been hired as our new Laboratory Safety Officer. She comes to us from industry where she has an extensive background in both laboratory safety and quality assurance. **Anita Quinn** has been reassigned from Molecular Diagnostics to assist with the implementation of our laboratory Quality Plan. **Lou Ann Risser** recently attended the Association of Official Analytical Communities meeting in Orlando, Florida.

Reception... **Amy Dean** has been promoted to Processing Assistant IV and is now in charge of billing. Both **Susan Gay** and **Brandy Rodgers** attended a continuing education seminar on "The Secrets of a Front Desk Superstar", while **Tamara Seago** attended a computer class on Beginning Access.

Virology... **Jeremi Brown** has been hired as a Medical Laboratory Technician II. She has a Bachelor's degree in zoology from North Carolina State University. **Dr. Gene Erickson** attended the Allen D. Lemman Swine Conference in St. Paul, Minnesota in September and gave a presentation on influenza diagnostics.

ARDEN LABORATORY:

Mary Swanson, DVM has joined our roster as a Medical Laboratory Assistant.



Disease Trends

Feline Trichomoniasis by Dr. Karen Post

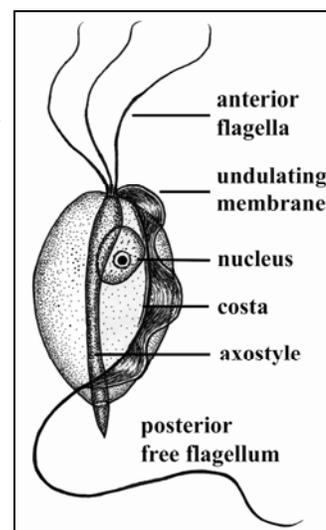
Trichomonas foetus, a venereal pathogen of cattle, has been recently identified as a feline enteric pathogen. It may be on the rise as a cause of large bowel diarrhea in domestic cats. The organism does **not** appear to be a normal component of feline intestinal flora. Infection is transmitted by direct fecal-oral contact. Following experimental infection, *T. foetus* colonizes the feline ileum, cecum, and colon, resulting in diarrhea which is characteristic of the natural infection.

Prevalence and risk factors

Infection is prevalent in young animals that are densely housed. In a survey conducted by Dr. Jody Gookin of NCSU/CVM (our local resident expert), 36 out of 117 (31%) healthy cats being exhibited at a large cat show were positive for *T. foetus*; their feces ranged from formed to diarrhetic. A study found that 75% of cats were one year or younger at the time of diagnosis. At the Rollins Laboratory, we have diagnosed three cases of feline trichomoniasis within the last year.

Clinical Signs

Affected cats are generally healthy. Their stools are semi-formed (“cow-pie-like”) and have a foul odor. Also, fresh blood or mucus is often observed. Frequency of defecation may be slightly increased. Infected cats may have an inflamed anus, fecal incontinence, or rectal prolapse. These cats are usually negative for feline leukemia and feline immunodeficiency viruses. The organism does not cause small bowel disease. A consistent trend is that the diarrhea improves during antimicrobial therapy and returns shortly after therapy is discontinued.



Line drawing by Jarrod Wood

Diagnosis

The diagnosis of *T. foetus* presently depends on the demonstration of live organisms by direct microscopic examination of fresh feces or through fecal culturing. Recently, a sensitive and specific PCR test has been developed for diagnosis.

Direct Fecal Smear. Using a wet mount of fresh diarrhetic feces in warm saline and a 20 or 40 x objective, trophozoites may be observed. These organisms have a characteristic pear-shaped appearance with anterior flagellae and vigorous motility. They are difficult to detect if the animal has recently been on antibiotics, and are often misidentified as *Giardia* spp. The direct fecal test has a low sensitivity, ranging from 2-14%.

Fecal culturing. Fecal samples must again be fresh, preferably diarrhetic, and processed expeditiously. [In Pouch TFTM Medium](#) (Biomed Diagnostics, White City, OR) is recommended for the propagation of trichomonads. Pouches are inoculated with 0.05 gm of feces and incubated at room temperature in an upright position for up to 12 days. Pouch contents are examined every other day for motile trophozoites using the 20-40 X objective. Death of organisms due to refrigeration or delayed processing of feces may cause false-negative results. Furthermore, positive identification of the infecting organisms may be problematic because *T. foetus* cannot be reliably differentiated from other intestinal trichomonads, such as *Pentatrichomonas hominis*, on the basis of light microscopy or selective cultivation. About half of the infected animals will be identified by this method.



Feline Trichomoniasis (continued)

PCR. More than 90% of infected cats are found to be positive with the PCR method, but the high cost of this test is a drawback to its routine use. Dr. Jody Gookin's biographical site (http://www.cvm.ncsu.edu/mbs/gookin_jody.htm) provides links to *T. foetus* information, such as, PCR test costs, sample submission, video-microscopy, research publications, and more. Fecal specimens need to be stored and transported at room temperature, as desiccation and refrigeration may kill the organisms. Results of a validation study demonstrate that the PCR test is ideally suited for diagnostic testing of feline fecal samples that are found negative by direct microscopy and culturing, and definitive identification of organisms seen microscopically.

Treatment

Presently, there are no approved, effective treatments for feline trichomoniasis. Infected cats have failed treatment with recommended dosages of metronidazole, fenbendazole, albendazole, sulfadimethoxine, trimethoprim/sulfa., furazolidone, fluoroquinolones, and paromomycin. Diarrhea is usually self-limiting within 9 months in most cats. Management approaches in multi-cat environments include good sanitation and keeping the environment clean and dry to reduce the spread of infection.

Dr. Gookin has found that the administration of oral Ronidazole twice daily at 30-50 mg/kg for 2 weeks is capable of resolving diarrhea and eradicating experimental infection. Ronidazole (1-methyl-5-nitroimidazole-2-methanol carbamate) is a 5-nitroimidazole with anti-parasitic activity that is used to treat caged birds for trichomoniasis due to *T. gallinae*. This drug is not FDA approved for use in companion animals and is banned for use in food-producing animals due to human health hazards.

Canine Influenza by Dr. Karen Post



There has been only one suspect case of canine influenza to date in North Carolina. One of three dog sera submitted to the Cornell Veterinary Diagnostic Laboratory had a threshold titer of 1:32; yet, acutely affected dogs in kennel outbreaks in the Northeast develop HI titers of up to 1:4000. A joint publication has been created by the North Carolina Department of Public Health and Human Services, NC State University College of Veterinary Medicine and the NC Department of Agriculture & Consumer Services/Veterinary Division to assist clinical veterinarians in answering frequently asked questions about the disease. The following is a summary of that publication, which will be distributed by NCDHHS.

**Canine Influenza** (continued)**Is canine flu easily transmitted between dogs?**

Yes, it appears that the virus is now established in the dog population and is easily transmitted from dog-to-dog. The virus may be shed for 10 days before the onset of illness and for 10 days after the onset appearance of signs. Because the disease is new, it is unknown how widespread it is in the United States. To date, serologic testing has been concentrated in the northeastern United States and Florida, with a very low serologic submission rate from other states.

Is there a vaccine available to prevent the disease?

As of October 2005, there is no flu vaccine on the market for use in dogs. Flu vaccines approved for use in other species should **not** be used in an extra-label capacity on canines.

Other than vaccination, what can be done to prevent the disease?

If flu is known to be in the area, it would be prudent to avoid unnecessary contact between your pet and dogs unknown to you. You and your dog should avoid contact with dogs displaying signs of a respiratory illness.

Does canine flu cause disease in people or in other species?

No, at this time, transmission of the canine influenza virus from a dog to people or to other species of animal has not been shown. While this type of virus has been in the horse population for over 40 years, there is no evidence that it has been transmitted to people during that time.

What are the signs of disease?

It is currently thought that about 80 percent of dogs with the disease will have a mild illness with signs including cough, low grade fever and nasal discharge. It is also thought that a minority of dogs will have more serious illness with signs such as pneumonia and a high grade fever. It is possible that some animals will have minimal signs of disease, yet still have the respiratory illness. Also likely, is that some dogs will develop complications such as secondary bacterial infections, possibly causing death.

Where did it come from?

While it was first detected in racing greyhounds in Florida, the virus has the same genetic characteristics as equine influenza virus (H3N8).

Is this a new disease?

Yes, in a sense it is. The disease has only recently been identified in the canine population. Because it is a “new” virus to dogs, they will not have immunity to the influenza virus.

Is canine flu really just kennel cough?

No, it is not. Kennel cough is a different disease. The most common cause of kennel cough is caused by the bacterium, *Bordetella bronchiseptica*. Canine influenza is caused by a virus. However, the clinical syndrome is indistinguishable from kennel cough outbreaks.

**Canine Influenza** (continued)**What steps should be taken to contain the disease if a dog is diagnosed?**

If an animal has signs compatible with the flu, it should be confined away from other animals until at least 10 days after the onset of signs of disease. People handling the animal should be aware that they should wash their hands and change clothes before having contact with any other dogs. The virus is likely killed by routine disinfectants or a solution of 10 percent bleach.

What tests are available to diagnose the disease?

At this time, there are limited diagnostic options. Serology is perhaps the most reliable assay. Serological testing can be obtained through the [Cornell University Veterinary Diagnostic Laboratory](#). Paired serum samples are usually required. The initial sample is collected at the first presentation of the patient and then two to three weeks later. For dogs that have recovered from a case of “kennel cough”, a single serum sample can be used to determine whether the animal has been infected with canine influenza virus at some point in the past. Cornell University offers virus isolation on pharyngeal swabs. These samples should be collected from dogs in the acute stage of disease: high fever (temperatures greater than 103°F), coughing and serous nasal discharge of no more than a one day duration. Pharyngeal swabs collected several days after the onset of clinical signs are **not** useful for canine influenza detection. Isolation of canine influenza virus from swab specimens is a relatively unreliable way to confirm the infection to date, but that may be due to the time of sample collection, which is always a problem for reliable detection of influenza virus. The [Directigen Flu A®](#) antigen detection kit manufactured by the [Becton Dickinson Corporation](#) will detect virus easily once it is propagated in cell culture. However, attempted use of the device to date for nasal or pharyngeal swabs has been uniformly disappointing with no positive findings. Limited experimental infection of susceptible dogs swabbed for the test have been negative. The reason the test has been negative could be due to relatively low levels of viral excretion via the respiratory tract. Negative PCR-based assays for canine influenza remain as the only option for attempted detection of the virus in acutely infected dogs; but, swab sampling thus far has been negative. On the other hand, lung tissue from acutely infected dogs that die contains large quantities of virus that are readily detected by PCR or virus isolation.

What is available in North Carolina?

The Rollins Laboratory of the NCVDLs will provide PCR detection and virus isolation if there is a PCR positive on necropsied dogs. However, a fee will be charged for pharyngeal swabs submitted for viral detection by PCR. The fee is our normal companion animal microbiology fee in the amount of \$10. Please call the laboratory if you plan to submit samples from acutely ill dogs that you believe may be due to canine influenza to facilitate timely testing.

Where can I go for more information?

Florida Dept. of Agriculture & Consumer Services: www.doacs.state.fl.us/ai/

NCVMA: www.ncvma.org/

CDC: www.cdc.gov/

Cornell VDL: www.diaglab.vet.cornell.edu/issues/civ.asp

NCVDLS: www.ncvdl.com/



Interesting Cases

Feline Infectious Peritonitis (FIP) by Dr. Steven Rushton

A seven month-old female Persian kitten was presented to the Rollins Laboratory in Raleigh for a routine necropsy. The cat had been losing weight for the previous two months and had developed a pendulous abdomen the week prior to being euthanized. The gross necropsy revealed an abundant thick, yellow proteinaceous exudate within the abdominal cavity. There was also abundant fibrin exudation along the capsular surface of the liver, spleen and kidney. Numerous pinpoint beige nodules (granulomas) were located along the serosal surfaces of the abdomen and within the mesenteric lymph node. Histological examination revealed large infiltrates of vascular oriented macrophages, lymphocytes and neutrophils along the serosal surfaces of abdominal organs.

Feline infectious peritonitis (FIP) is an important and complex disease of cats caused by a virus belonging to the family *Coronaviridae*. The disease is most commonly thought to arise from a mutation of Feline Enteric Coronavirus (FCoV), which often causes no clinical signs, with the possible exception of mild diarrhea in cats. Feline coronavirus infections are extremely common in multi-cat environments. In densely housed groups of cats, it is not unusual to find that most cats (up to 80 to 90 percent in some situations) have been exposed to FCoV. In households with only one or two cats, the risk of Feline Coronavirus exposure is much lower. As a result, FIP is rare in households with few cats, with estimates as low as 1 cat in 5000. However, in households with high population densities, FIP deaths may reach 5 percent or higher. The ability of the individual cat to mount an effective immune response is also believed to be a major factor determining FIP development.



The two major forms of FIP can be distinguished on the basis of fluid accumulation -the presence of fluid in one or more body cavities- in *effusive* ("wet") FIP, and its absence in *non-effusive* ("dry") FIP. Effusive FIP is the more fulminant (sudden and severe) form of the disease, with a more rapid onset and shorter clinical course than the non-effusive form. An accumulation of fluid within the abdominal cavity, with progressive, painless enlargement of the abdomen, is probably the most common clinical manifestation of effusive FIP. Respiratory distress may develop when abdominal fluid accumulation is excessive or, more commonly, when accumulation of fluid occurs within the chest cavity, resulting in compression of the lungs. Other signs that may be seen include jaundice (yellowing of the mucous membranes and skin) and a mild anemia (low red blood cell count). Gastrointestinal, ocular, and neurologic signs may also occur in cases of effusive FIP. The course of effusive FIP is quite variable, but the usual survival time after onset of clinical signs is about two or three months. Some young kittens may survive for no longer than a few days, whereas some adults may live for six to eight months with active clinical disease.

No curative therapy for FIP currently exists; the disease is virtually always fatal once clinical signs have become apparent. The clinical diagnosis of FIP is made by evaluation of the history and presenting signs, and the results of supporting laboratory tests. It must be kept in mind that a definitive diagnosis of FIP can be made only by microscopic examination of tissues, either by biopsy or at necropsy. Any diagnosis made in the absence of such examination must be considered conjectural; hence, the vast majority of clinical diagnoses of FIP are presumptive in nature.



Visceral Artery Aneurysm and Rupture in Holsteins by Dr. Jennifer Haugland

Within the last three years, the Rollins Laboratory has received three Holstein cows that have died from a ruptured visceral artery. The first two cows originated from the same farm and were submitted within four weeks of each other. One cow had an aneurysm of the celiac artery with a consequent rupture that was located approximately 10 cm distal to the aorta. The second cow had an aneurysm of the cranial mesenteric artery with a subsequent rupture that was located 25 cm distal to the aorta. The third cow was recently submitted from a farm in a county nearby to the first two cows. This cow had a large (26 cm X 26 cm) aneurysm of the cranial mesenteric artery that was 5 cm distal to the aorta. This aneurysm had also ruptured. All three cows died from massive blood loss into the abdominal cavity. These cows were 3 to 3.5 years old, and their stage of production ranged from 65 days to 185 days in milk to 2 weeks shy of the calving due date. The first cow had a history of being off feed, decreased milk production, and abdominal distension for two days preceding death. Just prior to dying, she displayed abdominal pain. The second cow was kicking at her belly and repeatedly lying down and standing back up a few hours before she died. The third cow was in the close-up dry cow group and no clinical signs were observed. Laboratory diagnostic tests have included mineral analysis of the liver, BVD viral isolation, and histopathology; yet, the cause of the aneurysms has not yet been determined. There has been one report¹ of aneurysm and rupture of the cranial mesenteric artery that theorized that the aneurysm developed secondary to a structural defect, and that abdominal pain would not present until enlargement and local tissue stretching or circulatory disturbances causing intestinal ischemia occurred. Aneurysms of the visceral arteries with possible arterial rupture should be considered as another differential diagnosis for abdominal pain or sudden death after more common causes are excluded.

1. Angelos JA, et al. Aneurysm of the cranial mesenteric artery in a cow. *J Am Vet Med Assoc* 1995; 207(5):623-625.

Veterinary Staff

Rollins Laboratory (919) 733-3986

Director

Dr. David Marshall

Assistant Director

Dr. Karen Post

Veterinary Diagnosticians

Dr. Jennifer Haugland

Dr. Stacy Robinson

Veterinary Pathologists

Dr. Tahseen Abdul-Aziz

Dr. Peter Moisan

Dr. Steven Rushton

Veterinary Microbiologist

Dr. Gene Erickson

Arden Laboratory (828) 684-8188

Director

Dr. Richard Oliver

Veterinary Diagnostician

Dr. David Drum

Elkin Laboratory (336) 526-2499

Director

Dr. Darrell Rector

Veterinary Diagnostician

Dr. Mark Blakley

Monroe Laboratory (704) 289-6448

Director

Dr. Kim Hagans

Veterinary Diagnostician

Dr. Reg Ridenhour

Rose Hill Laboratory (910) 289-2635

Director

Dr. Carlton Rouse

Veterinary Diagnostician

Dr. Hope Lucas

