

Contact Us

Athens
 Phone: 706.542.5568
 Email: athndlab@uga.edu
Tifton
 Phone: 229.386.3340
 Email: dlab@uga.edu

Editor: Murray E. Hines II
 Associate Editor: Jerry Saliki
 Assistant Editors: Paula M. Krimer
 and Marcia RS Ilha

RETURN SERVICE REQUESTED

Presorted
 First Class
 U.S. Postage
 PAID
 Permit 11



We're on the web, and
 we have a new look!
www.vet.uga.edu/dlab

MEET THE FACULTY

DR. PAULINE RAKICH



Dr. Rakich is a board-certified clinical pathologist at the AVDL and professor in the Department of Pathology. She grew up in Minnesota and received her DVM from the University of Minnesota before moving to Georgia for a small animal internship. She completed a combined clinical pathology residency and PhD at UGA, followed by a one-year dermatology residency.

Her areas of expertise are cytology, surgical biopsies, and dermatopathology, on which she has written numerous articles and textbook chapters. She teaches dermatopathology to pathology and dermatology residents, consults with VTH clinicians concerning dermatology cases, and reads many of the skin biopsies for the AVDL. She welcomes your questions concerning problematic skin cases and encourages you to consult with her before taking biopsies to ensure the best lesions are sampled.

In her spare time she enjoys agility training with her dogs, reads at Recording for the Blind and Dyslexic, and is learning to play the harp.

DR. LEE JONES

Dr. Lee Jones is the field investigator for the Tifton VDIL and an assistant professor in the Department of Population Health.

Dr. Jones earned a master of science degree from UGA in 1987, worked in bovine reproductive technology research, development and production until 1994 and received his DVM from Colorado State University in 1998.

He practiced in a rural, general practice in Nebraska and founded Frontier Genetics, a cattle embryo transfer and equine breeding company, before coming to UGA.

He has served the Nebraska VMA as a director and chairman of the Large Animal CE Committee, chairman of the AABP Reproduction Committee and director of the Beef Leadership Team with the North Central Repro Task Force.

Dr. Jones' research interests include beef cattle herd health, calf pneumonia, stocker/backgrounding health programs, beef herd reproductive efficiency and advanced reproductive technologies in beef cattle.



TABLE OF CONTENTS

- 1 Message from the Directors
- 2 What's New at the D-Labs
- 3 *Macrorhabdus ornithogaster* Infection in Pet and Farmed Birds
- 4 Potential Zoonosis and Transmission of *Brucella suis* from Feral Swine to Dogs
- 5 The Facts on Trichomoniasis
- 6 Personnel Highlights
- 7 Sample Storage
- 7 Eastern Equine Encephalitis Testing
- 8 Meet the Faculty

Visit Us on the Web!
www.vet.uga.edu/dlab

Receive results by email
 or view results online.
 To obtain pre-paid FedEx
 labels, or for other
 inquiries, give us a call:

Athens: 706.542.5568
 Tifton: 229.386.3340

MESSAGE FROM THE DIRECTORS

Jeremiah (Jerry) T. Saliki and Murray E. Hines II

Welcome to the Spring 2012 issue of *Diagnostic Veterinary Matters*. In the last four issues we shared with you the problems we are dealing with as a result of persistent steep state budget cuts in the face of rising operational costs. Those difficulties notwithstanding, our laboratory system remains strong in large part because of our partnership with you. We want to dedicate this issue to that partnership.

First, we want to thank you for your business and your loyalty. We know that you have choices when it comes to where to submit your diagnostic samples—ranging from other state laboratories to private commercial laboratories. We thank you for choosing our labs for your diagnostic testing.

Our recent budget difficulties have reiterated the importance of our partnership with you. Indeed, as state and federal dollars have decreased, the relative percentage of our operational budget supported by fee income has steadily increased. We do not take your business for granted; we believe the quality of the services we provide to you has earned your business, and we want to maintain our partnership by continual improvement of our services.

This is why we maintain a rigorous quality management system that is verified by our accreditation with the American Association of Veterinary Laboratory Diagnosticians. This is also why we have striven in recent years to increase the number of tests

offered and improve the quality and timeliness of test results, while still remaining competitive by limiting the rate of fee increases.

Secondly, we want to continue to explore ways of serving you better. We know many of our clients would favor the use of a courier service if we had one available. However, cost considerations do not permit us to offer a courier service at this time. We have made arrangements with FedEx whereby you can obtain pre-paid shipping labels from us, have FedEx pickup your diagnostic package at your clinic and deliver it to us; we will then pass on to you the reduced shipping fees charged by FedEx for delivering your package. We encourage you to use this service because of its convenience, low cost, and reliability. Call the laboratories to receive pre-paid shipping labels.

We encourage suggestions and comments from you if there is something else we can do to better serve you. In this regard, we invite you to make your comments and suggestions known to us by completing our annual client survey that many of you receive once a year via e-mail or a hardcopy by mail.

Again, thank you for your business and we look forward to our continuing partnership in the service of all people associated with various production and pet animal species.

Murray E. Hines II
 Jeremiah [Jerry] T. Saliki

WHAT'S NEW?

TIFTON

Business office:

All results are communicated directly to your veterinary hospital/clinic using the medium (email, phone, fax, or regular mail) you select at the time of submission. We cannot discuss results with animal owners. Please do not instruct owners to contact the laboratories directly.

Clinical pathology Section:

1. The clinical pathology section at the TVDIL now has a new chemistry unit ADVIA 1800 with the ability to perform more tests with less specimen (0.5ml minimum). All tests are serum blanked prior to performing individual tests.
2. Urine Chemistry tests we offer include: Na, Cl, Ca, K, Mg, inorganic phosphorus, urea nitrogen, creatinine, urine protein specific, and uric acid.
3. Phenobarbital serum sample handling instructions: Collect in a red top vacutainer tube and allow to clot. Spin down and pour serum into sterile tube. Ship overnight with an ice pack. Marked lipemia and hemolysis should be avoided.
4. We offer the serum cholinesterase test for organophosphates exposure, serum drug test for digoxin, and serum hormone testing for testosterone, estradiol, and progesterone.
5. Two other specialty tests offered are ammonia and insulin. Specimen required for ammonia is EDTA plasma and must be sent overnight on ice (remove plasma immediately from blood cells and keep it refrigerated). Specimen required for insulin is serum sent overnight on ice.
6. Thyroid hormones can be ordered in panels of two to five tests for a discounted price:
T3, T4, FT3, and FT4 (\$18.00 each hormone)
TSH (\$25.00)
2-test panel (any two thyroid hormones): \$30.00
3-test panel (any three thyroid hormones): \$40.00
4-test panel (any four thyroid hormones): \$50.00
5-test panel (all five): \$60.00
All these tests are available on a daily basis.
7. Due to the current budget constraints we are temporarily discontinuing the serum electrophoresis test in the Clinical Pathology section at the Tifton Diagnostic Laboratory. We hope to reintroduce this test again in the future.

ATHENS

New Tests

The following new tests are now being offered by the Athens Veterinary Diagnostic Laboratory:

1. Bacteriology: Susceptibility testing for rapidly growing *Mycobacteria*, *Nocardia* and other aerobic Actinomycetes.
2. Pet food *Salmonella* testing.
3. Molecular diagnostics:
 - BRSV — Bovine Respiratory Syncytial Virus
 - *Salmonella* DT104
 - *Erysipelothrix*
 - Equine Arteritis Virus
 - *Nocardia* spp.
 - EHV-4 — equine herpesvirus type 1
 - *Flavobacterium columnare*
 - *Mannheimia haemolytica*
 - *Mycoplasma pulmonis*
 - Equine Respiratory Panel 1— EHV1, *S. equi*, Influenza A
 - Equine Respiratory Panel 2 — EHV1, *S. equi*, Influenza A, EVA, EHV4
 - Bovine Respiratory Panel 1 — BVD, PIV3, IBR, BRSV
 - Bovine Respiratory Panel 2 — BVD, PIV3, IBR, BRSV, *Mycoplasma bovis*, *Pasteurella multocida*, *Mannheimia haemolytica*
 - Pig Diarrhea Panel — *C. difficile* A & B, *C. perfringens* A & C, *Salmonella*, Enterotoxigenic *E. coli* — Vt2, F18, *Lawsonia intracellularis*, Coronavirus, Rotavirus, Cryptosporidium; Outside tests included in panel — *Brachyspira piliosicoli* & hyodysenteriae
 - Adult Equine Diarrhea Panel — *Salmonella*, *C. difficile* A & B, *C. perfringens* A & C, Coronavirus
 - Pediatric Equine Diarrhea Panel — *Salmonella*, *C. difficile* A & B, *C. perfringens* A & C, Rotavirus, Coronavirus.

For more information on these tests, please visit our website: vet.uga.edu/dlab and click on the "Tests & Fees" menu item. 📄

SAMPLE STORAGE

Do you want to order additional tests on samples you've already submitted? Samples are stored for a short time after tests have been completed. This table explains how long our laboratories store routine samples before they are safely discarded. Please indicate legal cases on submission or contact us immediately if your sample becomes part of a legal process.

Service	Tests	Sample Type	Minimum Storage Time
Microbiology	Culture, PCR	Swabs, Tissue, Fluids	1 week
Microbiology	Culture	Cultured bacterial isolate	1 week
Serology	Titers	Serum	1 month
Virology	FA or VI	Tissue, Fluids	2 weeks
Pathology	Biopsy, Necropsy	Formalin-fixed tissue	3 weeks
Pathology	Biopsy, Necropsy, Immunohistochemistry	Paraffin blocks	10 years
Pathology	Biopsy & Necropsy	Glass slides	10 years
Clinical Pathology	Cytology	Glass slides	2 weeks
Clinical Pathology	Biochemistry, Endocrinology	Serum	1 week
Clinical Pathology	Urinalysis/Fluid analysis/CBC	Urine/Fluid/Whole blood	1 week
Pathology/Toxicology	Necropsy/Toxicology	Frozen tissues	6 weeks

EASTERN EQUINE ENCEPHALITIS (EEE) TESTING

The Tifton Diagnostic Lab is now offering a Hemagglutination Inhibition (HI) test for detection of antibodies to Eastern equine encephalitis (EEE) virus. This test will replace the SN test previously offered, and costs \$14. This test is recommended for screening for antibodies to EEE virus from exposure and vaccination from any species. For suspect horses with clinical signs we recommend the IgM antigen capture ELISA. The sample required for both tests is serum.

EEE is a viral disease prevalent in eastern United States that causes serious disease in horses, humans and birds, and is one of the most serious mosquito-borne diseases in the U.S.

The primary EEE virus transmission cycle is maintained between birds and mosquitoes. In horses, the disease is fatal and horses are considered dead-end hosts for the EEE virus. Disease in horses has an incubation period of five to 14 days. Clinical signs include fever, anorexia, depression, hyperexcitability, blindness, ataxia, recumbency convulsions and death.

Mosquito control and vaccination of horses is highly recommended to prevent this fatal disease. The EEE virus can cause severe disease in humans with a mortality rate of 30 to 70 percent and a high frequency of permanent disabilities in surviving patients. For more information on human infections, visit: www.cdc.gov/ncidod/dvbid/Arbor/eeefact.htm

BRUCELLA, continued from page 4

However, recommendations regarding *B. canis* infections in dogs for the state of Georgia are available at the reference below (1) and may be used as a general guideline in the event of suspected exposure of dogs to *B. suis*. 📄

Reference:

1. Communication of the Georgia Department of Community Health (DCH) Division of Public Health. BRUCELLOSIS; Information for Dog Owners. 2011. <http://health.state.ga.us/pdfs/epi/zvbd/brucellosis%20info%20for%20dog%20owners.pdf>



PERSONNEL HIGHLIGHTS

ATHENS

1. **Dr. Paula Krimer** has been recommended for promotion to associate professor, with tenure effective July 1, 2011. Congratulations on this achievement, which recognizes her stature and assures that she can continue to provide our clients with high-quality diagnostic cytology and histopathology services.



Krimer

2. The following staff members successfully completed certificate training programs conducted by the Veterinary Information Network. This training enhances their ability to serve our clients:

- Veterinary Medical Terminology—The Basics: **Jennifer Lightsey, Wendy Cunkle, Joanne Greenway** and **Natasha Liburd**
- Veterinary Medical Terminology—Clinical Practice Applications: **Jennifer Lightsey, Wendy Cunkle** and **Joanne Greenway**

3. **Gulnaz Shaikh** and **Pam Currin** successfully completed the 2011 Johne's serology proficiency test; the AVDL will remain certified to conduct this test through December 31, 2012.

4. **Paula Bartlett, Sara Bates** and **Ingrid Fernandez** successfully completed the proficiency test for classical swine fever and foot-and-mouth disease, thus assuring that the laboratory maintains its capacity to detect foreign animal diseases.

5. **Ashley Phillips** and **Amy McKinney** participated in and successfully completed the AAVLD Inter-Laboratory Bacteriology Quality Assurance Survey.

6. **Dr. Sanchez**, along with **Dr. Rajeev** at the Tifton Lab received an FDA grant of \$60,000 to study Salmonella in pets in Georgia.

7. **Drs. Doris Miller** and **Cathy Brown** won UGA First Year Odyssey awards for special seminars to first-year UGA students.

TIFTON

1. The Tifton Diagnostic Laboratory Business Office would like to announce the addition of **Kristie Goins** to our staff. Kristie is filling the associate accountant position left vacant by the passing of Krista Mattocks last year. Kristie, who was employed at the TVDIL for 18 years as a laboratory technician, has worked in various units in the lab. She holds dual degrees in biology and general business and decided to make a career change to the Business Office in October 2011. We are happy to have Kristie as a member of our staff.

2. We welcome **Ashley Burroughs** as the new laboratory technician within the Virology/Serology Section. Ashley joined the TVDIL on January 3rd.

3. **Clinical Pathology staff** successfully completed the quarterly VLA Quality Assessment which included samples for hematology, urinalysis, endocrinology, parasitology, and chemistry.

4. **Serology staff** successfully completed the Johne's ELISA and Anaplasmosis cELISA proficiency tests.

5. **Jill Johnson** successfully completed the foot-and-mouth and classical swine fever PCR proficiency tests.

6. **Michele Coarsey** and **Candice Jackson** successfully completed the classical swine fever PCR proficiency test.

7. **Julie Musgrove, Michele Coarsey, Candice Jackson,** and **Debbie Blakey** successfully completed the pseudorabies proficiency tests for gB and g1 ELISA. 📄



Coarsey

MACRORHABDUS ORNITHOGASTER INFECTION IN PET AND FARMED BIRDS

By Angela E. Ellis, DVM, PhD

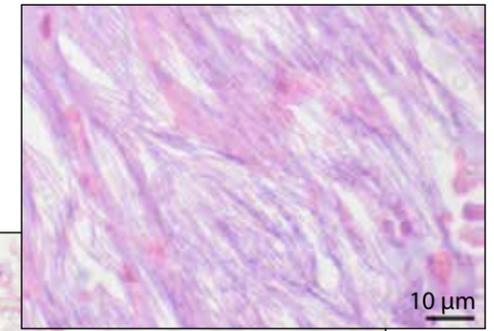
Macrorhabdus ornithogaster is a well-known cause of proventriculitis in birds. Although this organism was originally termed *Megabacterium* due to its large, rod-like appearance, the organism has since been classified as an anamorphic ascomycetous yeast. Clinical signs may be variable and include sudden death or chronic wasting. Diarrhea or enteritis has also been reported in birds colonized by *Macrorhabdus*; however, these birds can have concurrent enteric parasites, bacterial infections, or other diseases that could cause diarrhea.

Gross lesions may include proventricular edema, hyperemia, or hemorrhage, but a characteristic feature of this disease is overproduction of mucus and the proventricular lumen often contains abundant mucoid material. The proventriculus may also be dilated, and in severe cases there can be pro-

ventricular rupture and peritonitis. Culture of the organism is difficult. However, the organism is easily recognizable in histologic sections, providing that appropriate sections are available for examination. The proventricular/ventricular junction, or isthmus, is most useful in identifying these organisms. Although gross changes are most prominent in the proventriculus, histologic changes are more prominent in the ventriculus. Histologically, affected birds typically have marked disruption of the koilin layer with disorganization and degeneration, and there are large numbers of yeasts which have a matchstick or logjam appearance. Lymphoplasmacytic to heterophilic inflammation may be present, and there may be foci of

hemorrhage. In the proventriculus, there is mucous cell hyperplasia with a thick layer of mucus covering the mucosal surface.

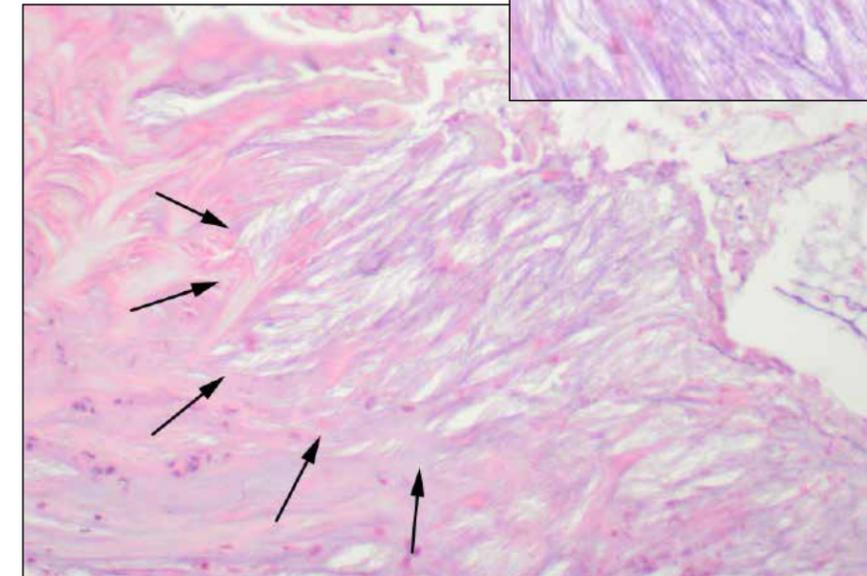
The exact prevalence of this organism is unknown,



and not all infected birds have clinical disease or histologic lesions. *Macrorhabdus* is considered common in budgerigars, canaries, finches, and parrot-

lets. One study identified organisms retrospectively in approximately one-fourth of canaries and budgerigars. Infection has also been reported in chickens, partridges, and ostriches. Chickens tend to be mildly affected, partridges were reported to have rare, fatal disease, and severe clinical disease may be present in ostrich chicks.

An important differential in pet birds with proventricular dilation is proventricular dilatation disease (PDD). PDD is characterized by chronic wasting disease with or without neurologic signs. These two diseases are easily distinguishable histologically with PDD characterized by lymphoplasmacytic ganglioneuritis of the alimentary tract and absence of koilin disruption. However, sampling of tissues is critical. In birds being submitted as mail in necropsies, it is recommended that a complete set of formalin fixed tissues be submitted and should include (but not be limited to) crop, proventriculus, ventriculus including isthmus, and brain. 📄



Ventriculus from a bird with *Macrorhabdus ornithogaster*. Only the koilin layer is shown. Koilin is markedly disrupted by sheets of large, rod-like yeasts (arrows). The inset shows these organisms in greater detail.

POTENTIAL ZONOSIS AND TRANSMISSION OF *BRUCELLA SUIIS*

FROM FERAL SWINE TO DOGS

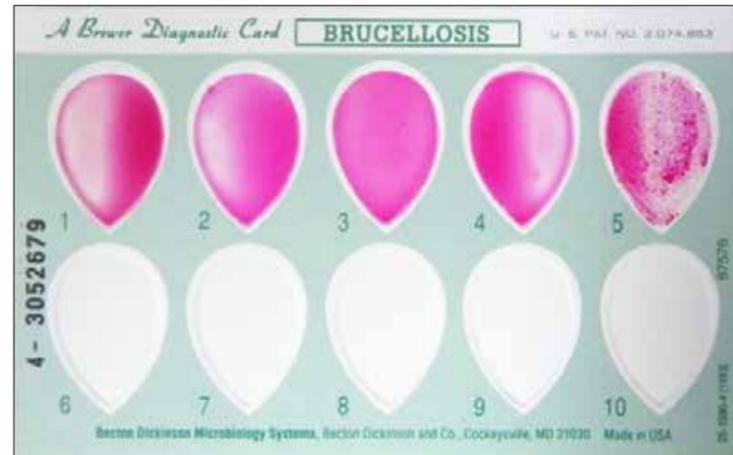
By Sheela Ramamoorthy, BVSc, M.S., PhD

Brucella spp. are Gram-negative coccobacilli that affect a wide variety of hosts. *Brucella suis*, *B. abortus*, *B. melitensis* and *B. canis* primarily affect pigs, cattle, sheep and goats and dogs respectively, but can be transmitted to animals which are aberrant hosts.

Brucellosis is a chronic, debilitating disease characterized by reproductive failure, lymphadenopathy and orchitis in animals and

Undulant Fever and arthritis in human beings. Human infections are usually associated with the consumption of non-pasteurized dairy products, undercooked meat, and handling of infected meat or animal abortion tissues. Therefore, it is an occupational hazard for hunters, farmers, veterinarians and abattoir workers. Efforts to eradicate cattle and swine brucellosis in the U.S began as early as 1934 and the U. S is largely free of brucellosis in domestic animals. However, wild animals such as bison, elk and feral swine continue to harbor and occasionally transmit *Brucella* spp. to domestic animals and in-contact human beings.

Brucellae can be cultured from blood, milk, semen, testicular tissue, and aborted fetuses. However, serological testing plays an important role in monitoring disease status. The common serological tests utilized include rapid slide agglutination (card or RSAT) tests, buffered *Brucella* antigen plate tests (BAPA), complement fixation tests (CFT), fluorescence polarization immunoassay (FPIA), tube agglutination, agar gel immunodiffusion (AGID) test and enzyme-linked immunosorbent assays (ELISA). Serological test results should be interpreted with caution because Brucellae cross-react with other bacteria such as *Yersinia enterocolitica* and *E. coli*. At the Tifton Veterinary Investigational and Diagnostic Laboratory (TVDIL), all samples are tested for antibodies to *B. abortus* by the BAPA test. Positive results are confirmed by a second test, the RSAT. Since dogs can be infected with both *B. canis* and *B. abortus*, canine sera



Brucella CARD test. Numbers 1 to 4 are negative samples; 5 is a positive sample.

are additionally tested on a *B. canis* specific tube test and positive results confirmed by an AGID test. A sample which is positive on at least two tests is considered a confirmed positive. Confirmed positive results are reported to the State Veterinarian's office and may result in positive animals being euthanized or quarantined. In some cases, additional serological or culture testing may be carried out at the National Veterinary Services Laboratory (NVSL) in Iowa.

Several hundred canine samples are routinely processed at the TVDIL following the above protocol. Occasionally, some samples are positive on the *B. canis* specific tests, indicating possible exposure of the dog to *B. canis*. However, between March and June of 2011, nine dogs located in either the Georgia cities of Dublin and Sylvester or Tift and Dougherty counties were unexpectedly found positive on the BAPA and RSAT tests which detect smooth *Brucella* strains such as *B. abortus* and *B. suis*, but not rough-strains such as *B. canis*. The same samples were negative on the *B. canis* specific tube agglutination and AGID tests. Bacteriological culture and histopathological examination of testicular tissues from two of the dogs confirmed that the dogs were indeed infected with swine origin *B. suis*. In further examination, the case history revealed that all seropositive dogs were hog hunting dogs and had been recently exposed to feral swine which was the likely source of infection.

Hunters should take appropriate precautions such as wearing gloves while handling meat from feral hogs. Similarly, owners of hunting dogs or outdoor dogs with a high possibility of contact with feral hogs should monitor their dogs for clinical signs of brucellosis including fever, lethargy, enlarged lymph nodes, orchitis and arthritis. Should brucellosis be suspected, paired serum samples collected two weeks apart can be sent to the TVDIL for testing. Very little scientific information is available about *B. suis* infection and diagnosis in dogs.

see *Brucellosis*, page 7

THE FACTS ON TRICHOMONIASIS

By Dr. Lee Jones, MS, DVM

Trichomoniasis is a sexually transmitted disease in cattle that can cause significant economic losses in herds. The disease is caused by a single celled parasite, *Tritrichomonas foetus*. Though the true prevalence of trichomoniasis in cattle is not known, several states have recently enacted stringent rules to control the importation or transmission of the disease.

The parasite lives in the prepuce membranes of infected bulls without affecting semen quality or sexual behavior. Susceptible cows are infected when they are bred by an infected bull. In cows, *T. foetus* often causes early embryonic or fetal death, abortion, pyometra, fetal maceration and/or infertility. Economic losses from *T. foetus* are associated from reproductive wastage, culling and replacing infected bulls and open or late cows, lost calf crop and delayed conception. In rare cases, a cow may become pregnant, deliver a healthy calf and still carry the infection into the next breeding season. Though a vaccine exists to help control infection in cows, **there is no effective treatment for infected bulls**. The disease is spread between herds by the introduction of infected breeding stock.

Definitive diagnosis of trichomoniasis is made by detecting the organism in prepuce samples from bulls following at least a two-week sexual rest. Parasites may be detected by direct, microscopic observation of the sample, *in vitro* culture (enhances parasite numbers) of the sample and microscopic examination, or the use of polymerase chain reaction (PCR) for initial, confirmation or differentiation from non-pathogenic trichomonads. At least three negative tests performed one week apart are required to declare a bull negative.

Prevention is the most effective approach in controlling this disease. It is recommended that only virgin replacement cattle be added to the herd. If a used bull is to be used then he needs to have at least three negative tests prior to introducing to the cows. Adding open, dry cows to the breeding herd is a high biosecurity risk and is not advised. Good fences to control introduction of infected cattle from neighboring herds



is also important.

Within the last 12 months two bulls have tested positive for this parasite in the state. One was from a group of bulls sold through a south Georgia sale barn in April 2011. Other bulls from the same herd were not tested and presumably were distributed to other herds. The other positive case was from a young bull exposed to cows brought in from Texas. Due

to the high number of livestock brought into the state from areas affected by drought, it is likely more cases of Trichomoniasis could be diagnosed. The Georgia beef herd increased by more than 10% in 2011, primarily from imported livestock from drought-affected areas.

TRICHOMONIASIS IMPORT TESTING REQUIREMENT - GEORGIA DEPARTMENT OF AGRICULTURE

Newly adopted Rule 40-13-2-.07, entitled "Bovine Trichomoniasis," requires testing of all virgin and non-virgin bulls 18 months of age and older before entering Georgia. The rule requires bulls to test negative within 30 days prior to entering the state. The rule prevents bulls from having contact with female cattle between the test and importation into Georgia. Bulls comingled with cows after testing are required to be retested.

All bulls must be identified with a USDA-approved ear tag, registry brand, or registry tattoo. The rule further provides that the collection of samples must be conducted by an accredited veterinarian and that animals must be identified on an official test chart.

The rule allows the State Veterinarian to exempt certain bulls from trichomoniasis testing. This includes: bulls going directly to slaughter; bulls being transported through Georgia in interstate commerce and not offloaded and comingled with female cattle; and virgin bulls under 18 months of age.

For additional information please contact the Georgia Department of Agriculture Office of the State Veterinarian at 404.656.3671.

