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Animal Health MATTERS Newsletter

Veterinary and Biomedical Sciences

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## Animal Health MATTERS

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# Animal Health MATTERS



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## Head/Director's Message

David H. Zeman, DVM, PhD

## ADRDL invited to join the NAHLN

The SDSU ADRDL was recently invited to join the National Animal Health Laboratory Network (NAHLN). Formal application and agreements are pending. The invitation went out to all AAVLD accredited laboratories that are currently doing USDA contract surveillance testing. The ADRDL is in its second year of USDA contract testing for Chronic Wasting Disease (CWD) of deer and elk, and Scrapie of sheep. Both are prion associated diseases with high interest to the government and stakeholders. Other surveillance activity of the entire network includes BSE, Exotic Newcastle's Disease, and Avian Influenza. Foreign animal disease surveillance is a major target for the network.

The NAHLN is a State and Federal partnership to safeguard animal health. The network blends the expertise present in State and Federal labs, and creates coordination and capacity for emergency disease preparedness. USDA National Veterinary Services Laboratory is the lead agency with steering committee representation from the USDA Cooperative States Research, Education and Extension Service, the American Association of Veterinary Laboratory Diagnosticians (AAVLD), and the US Animal Health Association. The planned expansion will lead to NAHLN representation in 37 states and 43 laboratories.

## Diagnostic News - SDSU ADRDL

### Bovine genital trichomoniasis in western South Dakota

David Zeman, DVM, PhD, Holly Kroschel, Deb Murray and Jennifer Beck, SDSU

Between May 5<sup>th</sup> and June 1<sup>st</sup> 2004, Bovine Genital Trichomoniasis was identified in three different beef herds in western South Dakota. The detection was the result of testing breeding-age bulls prior to the pasture breeding season. Preputial smegma was collected by the referring veterinarian and inoculated into commercial culture media (InPouch TF by Biomed Diagnostics, San Jose CA). The inoculated pouches were sent to the SDSU Animal Disease Research and Diagnostic Laboratory (ADRDL) and incubated. Daily examination revealed the growth of trichomonads morphologically compatible with *Tritrichomonas* in some of the bulls. All positive specimens were reinoculated into fresh media and shipped to the University of California (Davis) Bovine Trichomonas Research Laboratory for speciation via molecular procedures. All positive samples were confirmed to be *Tritrichomonas foetus*.

- Herd One submitted two pouches to the ADRDL. The history indicated early abortion or absorption as indicated by open cows. Both samples submitted were positive for trichomonads.
- Herd Two submitted 18 pouches to the ADRDL. The history indicated about 15% of the cows were open from the 2002 breeding season, and that was repeated in 2003. Testing of the bulls prior to the breeding season in 2004 revealed three positive bulls out of the 18 tested and revealed Tritrichomoniasis as the likely cause of infertility problem in the two previous years.
- Herd Three submitted 20 pouches to the ADRDL with no history provided. Two samples tested positive and were confirmed to be *T. foetus* by molecular procedures.

Bovine trichomoniasis caused by *T. foetus* is a contagious venereal disease of cattle with worldwide distribution. Although cows tend to clear the infection after several months, bulls can carry the organism chronically in their preputial crypts. It has reportedly created up to 50%

reductions in calf crops due to infertility, early embryonic deaths and abortions. The disease has been rare in South Dakota for the past two decades. This finding of three infected herds in one spring is unusual.

**Sampling Advice:** Collecting preputial smegma from breeding bulls prior to the breeding season has been highly effective in detecting positive groups of bulls. Smegma should be loaded into the culture pouches (.5 to 1 ml of smegma maximum) and sent to the ADRDL for an official test result. It is important that the samples NOT be refrigerated or frozen. A loaded pouch should ideally be kept between 59 and 98 degrees F until it is placed in the incubator at the lab. During the warmer months in SD, samples can usually be safely shipped in an insulated box *without* ice. The organisms are very sensitive to cold temperatures. Pouches should not be overloaded with smegma, or bacterial proliferation will ruin the test and/or make visualization of the trichomonads very difficult. Since very rarely, there are trichomonads other than *T. foetus* that may be cultured from the prepuce; speciation by molecular procedures is now performed on all positive pouches to confirm the isolate is definitively *T. foetus*.

## Testing milk for mastitis at ADRDL

A new submission form for Milk Testing is now available at [www.vetsci.sdstate.edu](http://www.vetsci.sdstate.edu). Clients are encouraged to use this form when submitting milk for Mastitis Testing. The submission form has two separate boxes, one each for Bulk Tank Testing and Individual Cow Testing with specific tests the ADRDL offers. Please clearly indicate what you are requesting. Sensitivity reports will be available only if requested. The submission form also has some tips for sample collection. Sample quality is very critical for an accurate diagnosis. So please follow these tips to keep your sample free of contaminants which might be misdiagnosed as a

causative agent. And do not forget to keep your sample cold. Also take advantage of the shipping instructions noted at the bottom of the submission form to make sure that the ADRDL receives the sample in a GOOD SHAPE.

## Poultry biosecurity

From the Spring/Summer 2004 Poultry Health Report by the National Institute for Animal Agriculture:

“In response to continuing disease threats, the U.S. Poultry & Egg Association has funded the development of a new biosecurity training CD-ROM. Individuals may order free copies of the CD on the USPOULTRY Web site, [www.poultryegg.org](http://www.poultryegg.org). The biosecurity training program will assist in understanding the “hows and whys” of biosecurity.

USPOULTRY encourages industry professionals to check out the CD as a tool to move up to a different level of biosecurity for all areas of production.

To obtain more information about the biosecurity CD, contact USPOULTRY at (770) 493-9401.”

Submitted by Tanya D. Graham, DVM, DACVP

## Veterinary poultry specialists sought

The ADRDL would like to create a menu of veterinary practitioners from SD and the surrounding region that are in poultry specialty practices. The menu would be shown to poultry producers that arrive at the lab without a veterinarian working on their case. In such situations, the ADRDL is frequently asked for such information. If you would like your name on this list of poultry veterinary specialists, please send your complete contact information to the lab in care of Rita Miller, Office Manager. Thank you.

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## Research News - SDSU Veterinary Science Department

### VSD/ADRDL Professor Receives Grant to Establish Research Center

In July of this year, Governor Rounds awarded four grants for the creation of research centers in the State of South Dakota as a part of his 2010 Research Initiative. One of the awards was to Dr. David Francis of the Department of Veterinary Science for the creation of the Center for Infectious Disease Research and Vaccinology (CIDRV). The CIDRV was formed as consortium of researchers in Departments of Veterinary Science and Biology/Microbiology at South Dakota State University, and the Division of Basic Biomedical Sciences at the University of South Dakota. The Center will foster research activities

that will lead to the development of novel vaccine delivery technologies and products, and diagnostic methods for infectious diseases in humans and domestic animals. A major focus in vaccine technology will be to develop needle-less vaccine delivery systems. Funding for the first year of the grant was \$780,000. Similar funding is expected for each of five years, after which the CIDRV is expected to be self supporting through grants, contracts and revenues from marketable inventions. The largest portion of the 2010 Research Initiative Grant budget will go to the building of increased research capacity through the hiring of new faculty

researchers, support staff and providing stipends for graduate students. Funds will also be spent on the early development of novel ideas and products. In addition, funds will be spent

on programs to mentor and train new and less experienced research faculty and staff. Dr. David Francis will be the center director.

## Extension News - SDSU ADRDL

### Are white tail deer a threat for spreading BVDV in cattle?

CCL Chase, DVM, PhD, LJ Braun, P Leslie-Steen, T Graham, D Miskimins, JF Ridpath, SDSU

The role of wildlife reservoirs continues to be a major unknown in the epidemiology of bovine viral diarrhea virus (BVDV). Serological data indicates that a wide range of wild ruminants have BVDV antibodies. BVDV has been isolated from a mule deer in Wyoming. In this report we examine the gross, histological and virological findings of two isolation of BVDV in white-tail deer in southeastern South Dakota in areas with concentrations of feedlot, dairy and cow-calf operations.

Two white-tail deer were submitted to the Animal Disease Research and Diagnostic Laboratory in the fall of 2003 by the South Dakota Game Fish and Parks for chronic wasting disease (CWD) testing. Both animals were CWD negative. The first deer was submitted in October and was in good body condition. The second animal was submitted in December and was the past year's fawn and was in poor body condition. The animals were necropsied, and histopathology, viral antigen detection and virus isolation were performed. In addition the BVDV isolates were typed using polymerase chain reaction in both the Erns region and the 5'NCR.

The first deer had no remarkable gross lesions indicative of BVDV. There was an abscess in one lung. The BVDV FA on the lung was negative. A noncytopathic (NCP) BVDV was isolated from the lungs and the intestine. The ear notch was immunohistochemistry positive for BVDV antigen. The isolate was typed in the Erns region and was a BVDV genotype 2. 5'NCR indicated that it was a type 2a. The second animal was unthrifty and stunted. The animal had a gun shot wound and had multifocal mandibular abscesses and diarrhea. Necropsy of this animal revealed multifocal ulcers of the abomasums. Histologically the animal had lymphoid depletion of the spleen. The animal was FA positive for BVDV antigen and a NCP virus was isolated from the kidney, abomasums, and lung. Immunohistochemistry indicated the presence of BVDV antigen in the skin and all tissues tested. The virus was typed in the Erns region and was a BVDV genotype 1. Further genetic in the 5'NCR indicated the virus was a type 1b.

This report is significant because it is the first report of possible persistent infection in deer. This would represent a serious problem for any cattle operation with deer contact. The implications of these BVDV isolations on biosecurity and prevention programs are alarming as white-tail deer

reservoir represents a huge risk to cattle. This is the third report of BVDV in deer in North America and the first report of multiple isolations of both genotypes.

### Liver copper concentrations in calves

Six hundred and one cases were used to analyze liver copper concentrations in calves, up to one year of age, not having signs or lesions of toxicosis or deficiency and dying of something else.

Signs and lesions that excluded calves from the study included for **copper deficiency** myocardial atrophy, rupture of large blood vessels, anemia with iron <45 ppm, rough/coarse/poor hair coat, weight loss, abomasal ulcer, ataxia, lameness, and bony changes manifesting fractures. Evidence for **copper toxicosis** included depression, anorexia, hemolytic crisis, dyspnea, gastroenteritis, head pressing, circling, and liver disease.

The commonly used normal cattle liver copper reference range is 25-100 mg/kg (mg/kg = ppm) on wet weight basis. This range does not take into account age or production type of cattle.

This study found the following:  
The expected range of liver copper concentration (95% confidence level) for **groups of dairy calves is 63mg/kg to 136mg/kg and groups of beef calves is 36 mg/kg to 89mg/kg** wet weight basis.

The expected range of liver copper concentration (95% prediction limit) for **individual dairy calves is 20 mg/kg to 361 mg/kg and beef calves is 11 to 241 mg/kg** wet weight.

It must be remembered that these values were generated from calves that were submitted to a diagnostic laboratory in which other disease diagnoses were found. Therefore, these calves cannot be assumed to represent the normal healthy population. However, these data are very useful considering that most copper investigations on calves less than one year of age are done on unhealthy calves.

**NOTE:** This is just a brief review of the article and I encourage individuals interested in this topic to get the original article for it has many more useful and interesting points. Regg Neiger, DVM

Taken from *Influence of age and production type on liver copper concentrations in calves* by B. Puschner et. al. in J. Vet. Diagn. Invest 16:382-387 (2004)



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## Calendar of Events

**January 10, 2005** – Diagnostic Laboratory Update,  
Brookings, SD. For more information contact Janice  
Kampmann at 605-688-6649.

### Holiday hours:

Closed Friday, December 24 for Christmas  
Closed Friday, December 31 for New Year's  
Closed Monday, January 17 for Martin Luther King, Jr. Day  
Closed Monday, February 21 for Presidents' Day

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## IN THIS ISSUE

### Head/Director's Message

ADRDL invited to join the NAHLN..... 1

### Diagnostic News

Bovine genital trichomoniasis in western SD ..... 1

Testing milk for mastitis at ADRDL..... 2

Poultry biosecurity ..... 2

Veterinary poultry specialists sought..... 2

### Research News

VSD/ADRDL professor receives grant to  
establish research center..... 2

### Extension News

Are white tail deer a threat for spreading

BVDV in cattle?..... 3

Liver copper concentrations in calves..... 3

**Calendar of events**..... 4

**Holiday hours** ..... 4