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Animal Health MATTERS

David H. Zeman
South Dakota State University

SDSU Veterinary Science Department • Animal Disease Research & Diagnostic Laboratory

Animal Health MATTERS

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Head/Director's Message

David H. Zeman, DVM, PhD

ADRDL Receives Full Accreditation from AAVLD

In our spring newsletter I had mentioned that the ADRDL would be audited by the American Association of Veterinary Laboratory Diagnosticians* regarding our accreditation status. That audit occurred May 18 – 20, 2008. Four external auditors participated, all from other accredited animal health laboratories. This was the ADRDL's first AAVLD audit under the new internationally compliant accreditation standard, as recommended by the World Organization for Animal Health (the *OIE).* The new standard places highly prescriptive expectations for competent performance and documentation of factors that affect competence. The standard also has strict quality system management expectations, which stresses client satisfaction and accurate communication of test results.

The outcomes of the accreditation audit could have been *denied accreditation, provisionally accredited for one or more years, or fully accredited for one to five years.* I am very pleased to inform our clients and stakeholders that the ADRDL received **full accreditation for five years – the highest goal possible!**

I would like to thank all ADRDL employees for the hard work they have done over the past five years in implementing the extensive quality system expectations of the new accreditation standard. A special thank you goes to Rajesh Parmar, the ADRDL Quality Manager and the VSD Quality Committee. This team wrote the new quality system policies and procedures, implemented them and participated in internal audits and many other activities to make this a successful transition.

The AAVLD auditors did leave us with several ideas for improvement. One important observation by them was that we still have no high containment laboratory space to deal with highly dangerous or exotic disease outbreaks. The ADRDL Advisory Committee has been working with our stakeholders for sometime to address this need via a proposed high containment addition to our complex.

The ADRDL faculty and staff are committed to excellence and quality in their work. It is highly encouraging to receive external validation of our efforts. As always, we consider it a privilege and an honor to serve alongside the practicing veterinarian, animal owners and other stakeholders as we strive to improve animal health in our region.

*For more information about AAVLD laboratory accreditation see http://www.aavld.org

Diagnostic News - SDSU ADRDL

An Unusual Presentation of Blackleg in a South Dakota Beef Herd

Russ Daly, DVM and Dale Miskimins, DVM, SDSU

On August 4, 2008, a 250-pound Limousin-cross calf found near death on a pasture was submitted to the SDSU ADRDL for necropsy and diagnostic workup. At the time, the producer, located in southeastern South Dakota, had lost 7 additional calves from one particular pasture, which housed about 30 cow-calf pairs. Gross examination of this calf on necropsy revealed severe **fibrinous pleuritis, pericarditis, and epicarditis** (inflammation of the surfaces of the lungs, heart, and heart sac). Pleural adhesions were extensive, and adhesions from the diaphragm to the reticulum were also present. These lesions were suggestive of hardware disease, but no foreign objects were retrieved.

Histopath examination of the tissues revealed a suppurative and necrotizing pneumonia and suppurative and fibrinous pleuritis. The heart muscle showed severe suppurative and necrotizing myocarditis (inflammation) with extensive necrosis. In addition, inflammation was noted in the thymus and colon. There were areas of centrilobular necrosis present in the liver. Various levels of infection with coccidia, strongyles, and nematodirus were also observed in the intestine.

On the same day the calf was brought to the ADRDL, another calf died on the same pasture. This calf exhibited a rapid onset of labored breathing before dying shortly

thereafter. The referring veterinarian performed a necropsy on the calf and noted the same gross lesions as the previous calf: suppurative and fibrinous **pleuritis, pericarditis, and epicarditis**. Tissues were submitted, and included lung, liver, kidney, heart, and spleen. Histopath examination additionally revealed patchy areas of myocarditis with necrosis. No bacteria were grown on aerobic cultures. Liver chemistry analysis was unremarkable, and *Mycoplasma* culture was negative.

Calves on this pasture had not been vaccinated for anything upon turnout. One of the previous calf deaths had been suspicious for enterotoxemia, so calves were gathered and given a 7-way Clostridial vaccine just days before the other two calves died. After these two necropsy examinations, all calves on this pasture were vaccinated with an intranasal IBR-PI3 vaccine (TSV-2®, Pfizer) and treated with tulathromycin (Draxxin®, Pfizer). No other losses were observed on this pasture after that.

On August 28th, tissues from another calf, which was housed on a second separate pasture, were submitted. This time there were no lesions relating to pleuritis or pericarditis. The referring veterinarian who performed the necropsy noted only a small amount of hemorrhage present on the heart surface. However, an extensive examination of muscle tissue, including all large skeletal muscles, heart, tongue, and diaphragm, revealed one small, golf-ball-sized area of muscle necrosis and hemorrhage in the right caudal thigh muscle.

Laboratory examination of the submitted muscle tissue revealed microscopic lesions consisting of focally extensive necrotizing myositis (muscle inflammation and tissue death). Anaerobic culture, however, was negative on the muscle and heart samples, and a fluorescent antibody (FA) test for *Clostridium chauvoei* was negative.

Despite these negative findings, blackleg was strongly suspected, and the previous case that featured the pleuritis and pericarditis was re-opened. This time, heart muscle was recultured anaerobically, and a pool of lung and heart was subjected to an FA test for *C. chauvoei*. Both of these tests were positive for this organism, confirming the diagnosis of blackleg.

One day after that latest submission, another calf was found dead from a third pasture in which prior losses were not noted. Findings of the referring veterinarian consisted of severe necrosis of the caudal thigh and caudal abdominal muscles with gas formation. Lungs were normal grossly, and the heart had extensive superficial hemorrhage. Tissues, including skeletal muscle, were submitted to the ADRDL. In this case, anaerobic cultures grew *Clostridium spp*., and FA tests were positive for *C. chauvoei*.

Holiday hours:

Tuesday, November 11 – Veteran's Day
Thursday, November 27 – Thanksgiving Day
Thursday, December 25 – Christmas Day
Thursday, January 1 – New Year's Holiday
Monday, January 19 – Martin Luther King Jr. Day
Monday, February 16 – President's Day

In total, at least 14-15 calves were lost from about 60 pairs on a total of four different pastures. The cattle owner mentioned that his grandfather had observed blackleg cases in these pastures over 20 years ago, but discontinued vaccination after some calves supposedly reacted to the vaccine. No clostridial vaccines had been given to calves in this operation prior to turnout, then, for at least 20 years.

Blackleg is primarily a disease of pastured cattle, with a preference for cattle less than two years of age, usually cattle in good condition. It is often, but not always, associated with moist conditions when both forage and cattle are growing rapidly. Blackleg has a worldwide distribution, but seems to be very localized, even to certain farms or pastures. In those locations it is persistently, but irregularly, enzootic (established). Because of this localization, it is assumed that *C. chauvoei* is soil borne, but is not likely to grow in soil. It does grow well in the intestinal tract of cattle, however, and it's likely recycled through fecal contamination of the soil in those locations. It is unknown why the disease manifested itself so severely this year in this operation; however, moist conditions throughout the summer contributed to good forage growth in that part of the state.

The pathogenesis of blackleg is actually not completely understood, but it is known that cattle acquire the infection by ingesting the spores, which somehow pass through the intestinal mucosa into the bloodstream. The spores then travel to various tissues, including muscle, where they are "stored" for long periods by surviving in phagocytic cells. These latent spores are stimulated to germinate when local conditions result in muscle damage or low oxygen content.

The lesions noted in the initial submissions from this case were unusual – pleuritis and pericarditis with no obvious skeletal muscle involvement. Typical gross changes present in blackleg cases on initial examination feature crepitant swelling over the affected muscles. Subcutaneous tissues in the area of the lesion are thick with gelatinous, gassy yellow fluid that appears more bloody closer to the lesion. Towards the periphery of the muscle lesion, the muscle tissue is dark red and edematous. Towards the center, it is red-black, dry, and friable, often encompassing gas bubbles. Often there is a sweet, butyric odor associated with the lesion, like rancid butter. Lesions usually are found in the large muscles of the front and back legs, but they could be present in any striated muscle, including the myocardium, tongue, and diaphragm.

In addition to muscle lesions, other changes may be present in the carcass, including rapid degeneration of liver and kidney, which occurs more rapidly than conventional past-mortem autolysis.

But, as this case demonstrates, another change that may be present is that of **pleuritis**. In general, when associated with sudden death on pasture, and absent indications of severe pneumonia, **the presence of pleuritis, especially accompanied by hemorrhage, should make one suspicious of blackleg**. This has not been a common manifestation of blackleg cases diagnosed by the ADRDL, but blackleg should be included in the list of differentials for any case of sudden calf death on pasture, especially when this lesion is found in those cases.

Selected Abstracts, SDSU ADRDL Presentations, 2008 SDVMA Meeting

Abomasitis in Beef Calves

Dale Miskimins DVM, MS, ADRDL, SDSU

Abomasitis and abomasal ulcer problems in beef calves continue to frustrate producers and veterinarians. Affected animals are often found dead. Necropsy examination will often reveal perforated abomasal ulcers with subsequent peritonitis. Investigations have focused on infectious agents, various feeding systems and dietary regimens and nutritional deficiencies. The disease syndrome is thought to require a quantity of highly fermentable substrate and a bacterial flora capable of rapidly fermenting that substrate which leads to gas and acid production. Compromised neonates may be more prone to abomasitis problems. Separation of cow calf pairs during bad weather, processing, estrous cycles and transportation may also cause problems.

Test Validation: What it is and why it's important to you and your clients.

Tanya D. Graham, DVM, DACVP, ADRDL, SDSU

Test validation is required as a part of our AAVLD accreditation. This accreditation process ensures that the diagnostic laboratory meets or exceeds the standards described in the World Organization for Animal Health's Quality Standard and Guidelines for Veterinary Laboratories: Infectious Diseases, 2002 (ISO 17025). This guide emphasizes the selection of appropriate test methods that are widely accepted by scientists and regulators (i.e. allows for interstate or international movement of animals). In sections of the diagnostic laboratory that do not work with infectious diseases, the good laboratory practice principles in this document still apply.

The Manual of Diagnostic Tests and Vaccines for Terrestrial Animals, 2004, defines test validation as "…a step wise process which confirms truthfulness of the test in question and it helps establish client confidence in the services offered by a diagnostic lab. During the validation process, a test method is selected to find out how accurate and sensitive it is for the intended use… The reagents, growth media, machines, techniques etc. needed for the test method are standardized before the method is evaluated to determine how consistent it is in providing accurate results.

It is very important that the diagnostic labs validate test methods before using them to test client samples because by using validated methods, labs can help clients identify animals / birds as positive or negative for a disease (or a condition) on a consistent basis."

"Test methods may be classified as "validated for use" by meeting the following criteria.

1) Ongoing documentation of internal or inter-laboratory performance using known reference standard(s) for the species and/or diagnostic specimen(s) of interest, **AND** one or more of the following:
2) Endorsed or published by reputable technical organization
3) Published in a peer-reviewed journal with sufficient documentation to establish diagnostic performance and interpretation of results;
4) Documentation of internal or inter-laboratory comparison to an accepted methodology or protocol."

The bottom line: we can't just take a test kit off the shelf and assume that it works. If you have questions about the use of a new collection system method or any deviation in the type of sample(s) to submit, please call the lab @ 605.688.5171 first.

Wildlife Zoonoses and the Veterinarian

David Knudsen, DVM, MS, ADRDL, SDSU

During field activities, the veterinarian frequently encounters live and dead animals, waste materials, nests, and other potentially infectious fomites which may represent an occupational hazard to the investigator along with clients and staff. Infectious agents from wildlife species include viruses, bacteria, protozoa, and helminths, and risks may vary with host species, season, and other factors. Veterinarians need to recognize the more important zoonotic agents present in North America with some emphasis on the "big three" (Rabies, plague, and tularemia). Current recommendations for prevention and exposure control which are practical in the ambulatory setting, should be considered. Important zoonotic disease threats that may be encountered by veterinarians include:

Viruses: Rabies, Hantaviruses, West Nile and other arboviruses, Filovirus and other emerging viruses.

Bacteria: Plague (*Yersinia pestis*), Tularemia , (*Franciscella tularensis*), *Salmonella* sp., *Leptospira* sp., *Mycobacterium* sp., *Borrelia burgdorferi.*

Parasites: Giardiasis, Cryptosporidiosis, *Entamoeba histolytica, Rodenolepis nana, Echinococcus* sp., Other protozoa and helminthes.

Great Lakes fish die off due to VHS virus

Regg Neiger, DVM,PhD, ADRDL, SDSU

Starting in 2005, the VHS virus caused large die offs of fish in the Great Lakes. This disease was first confirmed in Lake Ontario in the spring of 2005 in Fresh Water Drum. This was the first time this virus had been confirmed within the United States and Canada in freshwater fish. By the end of 2007, the virus had been isolated from more than 25 species of freshwater fish in the Great Lakes and surrounding in-land waters.

In response, the USDA issued limitations of fish movement out of affected areas. This outbreak of VHS virus has ushered in a new era which intensifies the requirements for the movement of fish in the United States. In South

Dakota this affects us because now we many times need to test fish leaving the state for states that have lately restricted importations due to this heightened awareness of fish diseases caused by the Great Lakes VHS outbreak. In response to this need, ADRDL at SDSU is now offering a USDA approved VHS virus isolation examination.

Research News - SDSU Veterinary Science Department

Research Spotlight: Dr. Feng Li

Feng Li, M.V.Sc., PhD, CIDRV, SDSU

My laboratory focuses on understanding molecular mechanisms of viral replication and pathogenesis and using this information to design and evaluate strategies for diagnosis, prevention, and therapy of viral infections threatening human and animal health. We are currently working with two model systems: HIV/Retrovirus and influenza virus (A and B). Research foci in my lab are summarized below:

A. Virus maturation and its inhibition.

One of the least understood parts of the replication cycle of enveloped RNA viruses (including HIV-1), is maturation--the final step during which new virus particles emerge from the infected-cell surface and are released to spread the infection to new cells. We recently reported on 3-O-(3',3'-dimethylsuccinyl) betulinic acid (PA-457), the first in a new class of HIV-1 inhibitors, that blocks virus replication by disrupting virus maturation. Unlike protease inhibitors, PA-457 blocks a single step in the processing of the viral Gag protein: protease cleavage of the Gag capsid (CA) precursor (CA-SP1) to mature CA protein. This results in the release of immature, non-infectious viral particles, and also raises several interesting questions about the mechanism of virus maturation in general and HIV-1 maturation in particular, and how this process can be disrupted.

We are currently pursuing various approaches including biophysics, virology, genetics, structural biology, and medicinal chemistry to further define the mechanism of action, viral determinant, and molecular target of this novel inhibitor and its derivatives. Another major component of this research project is to harness all of the experimental approaches developed from HIV-1/retrovirus work to study the maturation pathway of other enveloped viruses such as influenza and Dengue. This project is currently supported by NIAID K02 independent scientist award (2008-2013) and NIAID R21 grant (2007-2009).

B. Actions of NS1 proteins of Influenza A and B viruses in HIV-1 Replication

NS1 is a multifunctional dimeric protein that participates in both protein-RNA and protein-protein interactions in influenza A and B viruses. Despite the fact that the NS1 protein of influenza B virus is less than 20% identical (amino acid sequence) to influenza A NS1, both proteins fulfill similar but not identical functions. Influenza B NS1 acts as an interferon antagonist and inhibits the interferon-induced PKR and subverts ISG15-mediated antiviral activity; however, influenza B NS1, in contrast to influenza A NS1, is not able to inhibit polyadenylation, splicing, and nuclear export of cellular mRNA. We have recently found that both NS1 proteins can inhibit HIV-1 protein expression and the inhibition seems to be dependent on HIV-1 Rev protein-mediated export of incomplete spliced mRNA. The inhibition of HIV-1 protein expression is not mediated through the degradation of HIV-1 Rev protein as reported in a previous study describing the action of influenza A protein in HIV-1 replication.

Interestingly, we have also found that the inhibition by influenza B NS1 is only restricted to HIV-1, which is in contrast to influenza A NS1-mediated broad-spectrum inhibition, for which protein expression of HIV-1 and its related lentiviruses (SIV, FIV, and EIAV) is affected. NS1 protein of Influenza C virus shows no inhibition of HIV-1 protein expression. We are currently studying the mechanisms by which NS1 proteins inhibit HIV-1 protein expression. This study could also lead to discover some novel functions of NS1 proteins, particularly influenza B NS1, in influenza virus replication.

C. Ubiquitin-like protein and de-ubiquitin enzyme in influenza A virus replication

Ubiquitin-like proteins have been believed to play an important role in both a positive and negative regulation of virus lifecycle. One such molecule, termed Interferon-stimulating-gene 15 (ISG15), has become a major focus of several laboratories, including our own, as it shows antiviral activity among several important viruses including HIV-1, influenza A and B, herpes, and Ebola. Several lines of evidence have recently suggested that ISG15 functions as a critical antiviral molecule against influenza A, however, the mechanism of action by ISG15 remains unknown. We have recently demonstrated that ISG15 and de-ubiquitin enzymes are active against influenza A virus but these effects can be subverted by a virus-encoded protein. Ongoing research in our group is to address how ISG15 and other ubiquitin-like proteins inhibit influenza A virus replication and how this protective mechanism can be circumvented.

D. Molecular mechanism of influenza virus production.

New antiviral drugs are needed in combating future influenza pandemics and the rising problem of antiviral drug resistance. Therefore, a better understanding of influenza virus replication is important to identify new viral targets and develop novel antiviral therapies. The overall objective of

this research project is to better understand at the molecular level the assembly and budding process of influenza virus from viral RNA polymerase complex formation within the nucleus to the final pinch-off event of newly formed virion at the plasma membrane of infected cells. A multidisciplinary approach involving pharmacology, genetics, biochemistry, virology, and cell imaging will be used in this study and the well-advanced studies on HIV-1 assembly/budding/maturation will be integrated and provide a guidance to direct the project. This project was supported initially by a sub-award NIAID grant through Rocky Mountain RCE and is currently supported by NIAID R21 grant (2008-2010).

Extension News - SDSU ADRDL

Communicating With Media

Source: Washington State Veterinary Medical Association

- When members of the media call ask, "What can I help you with today?"
- Remember your rights. You can ask the reporter for more information which will help you prepare for the interview. What type of story is being written? What is the angle and are others being interviewed? What is the reporter's deadline? Know or find out the audience (i.e. daily newspaper vs. TV news).
- Try to buy time to collect your thoughts, i.e. "Can I call you back in 30 minutes, I'm in a meeting now?"
- Prepare 3-5 key messages you want to communicate to your audience. Plan your points and make them early. Remember an interview is an opportunity to tell your story to your audience, not the media. Use every question as an opportunity to address your agenda.
    - (Editor's note): No matter what the topic of the interview, we as veterinarians have several important messages that underlie almost everything we do. During the interview, look to come back to one or more of these messages, depending upon what topic you are addressing. These messages may include:
        - Assuring the well-being of animals.
        - Assuring the health and well-being of people (zoonotic disease and public health).
        - Keeping our food supply safe.
        - Maintaining the economic sustainability of our farms and ranches.
- Be brief, professional, and calm. News is presented in small "bites" of information both for radio and television. Keep your messages down to a few lines and make sure to make your point often.
- Anticipate and rehearse possible interview questions and answers. What are your vulnerabilities?
- Use common language and examples. Every industry has its own jargon which some reporters may understand, but the general public may not. Be careful to explain abbreviations and avoid jargon.
- Tell the truth. Don't lie or speculate. Beware of hypothetical statements. If a reporter asks "would you say..." and then quotes a statement for your agreement or your disagreement, don't accept it. Don't let anyone determine your agenda. Make your own statement. Also, don't repeat the reporter's negative statements.
- Admit when you don't know an answer and offer to find it. Then do it.
- Never speak "off the record."
- Never say "no comment." If you can't comment, say you can't and explain why. "I'm sorry but our attorneys have asked us not to discuss that aspect." "Certainly you and your readers/viewers realize that this is an ongoing criminal investigation so I can't say anything that might jeopardize that."
- Help the reporter do their job. Consider this a business relationship not unlike talking to any other vendor or service provider you deal with daily.
- Be accessible, cooperative, and non-confrontational.
- Refute untrue statements immediately and politely. Make sure to correct it in an informative and helpful manner.
- Use data sparingly to underscore your most important points.

Summary of BVDV-PI Testing at SDSU ADRDL, July 2005-June 2008

Russ Daly, DVM, Extension Veterinarian, SDSU

Cattle persistently infected with Bovine Viral Diarrhea Virus (BVDV) are considered the reservoir for BVDV within the cattle population. Within individual herds, identifying these persistently infected (BVDV-PI) animals through individual animal testing has allowed for the removal of these animals or for the prevention of BVDV-PI animals from entering the herd, making testing a valuable procedure for maintaining cattle health.

Several different methods are available for BVDV testing at the SDSU ADRDL, the most popular of which are the individual ear notch ELISA and the pooled PCR test. For ELISA testing, the individual ear notch is suspended in saline solution at the lab, agitated, and an antigen-capture ELISA procedure performed on the fluid. The pooled PCR procedure, which was begun here in early 2006, also utilizes individual ear notches, which are also suspended in saline solution and agitated. Aliquots of fluid from each sample are

then pooled and subjected to PCR for BVDV. If positive pools are identified, then individual antigen-capture ELISAs are performed on the samples that comprised the pool.

To confirm true BVDV-PI status, a follow-up sample from the positive animal is recommended to be collected roughly 4-6 weeks later. If ear notches were used in the initial diagnosis, a blood sample is recommended for follow-up confirmation, for either virus isolation or PCR, to differentiate animals that are transiently infected from BVDV-PI animals.

The results below reflect testing performed on cases submitted to the SDSU ADRDL. These sample and case positive rates should not be applied to the cattle population in general, as submissions reflect many different scenarios: testing within known-BVDV-positive herds, testing individuals offered for sale, screening incoming purchased animals, etc. Bias, therefore, is likely present toward both the positive and negative side.

As awareness of BVDV infections increase with cattle producers and veterinarians, it is expected that as time goes on, that more herds will "clean up" BVDV-PI animals within their herds, and that BVDV-PI testing will move from a disease diagnostic function to more of a biosecurity/surveillance function: producers and veterinarians will focus more on preventing BVDV from entering herds rather than needing to remove infected animals.

For more information on BVDV testing at SDSU, go to http://vetsci.sdstate.edu/vetext and click on "Beef Cattle Issues" or "Dairy Animal Issues."

FY 2008 BVD Summary

Test	No. cases	No. samples	No. positives	No. pos cases	Pos. sample rate	Pos. case rate
Ear Notch ELISA	683	16,174	87	60	0.54%	8.78%
Pooled PCR + ELISA to ID indiv's*	145	17,540	12	8	0.07%	5.52%
Immunohistochemistry	169	1,238	8	5	0.65%	2.96%
Outgrowth ELISA	74	2,659	1	1	0.04%	1.35%
Serum ACE	45	265	0	0	0.00%	0.00%
TOTALS 2008	**1,116**	**37,876**	**108**	**74**	**0.29%**	**6.63%**

FY 2007 BVD Summary

Test	No. cases	No. samples	No. positives	No. pos cases	Pos. sample rate	Pos. case rate
Ear Notch ELISA	703	19,832	72	54	0.36%	7.68%
Pooled PCR + ELISA to ID indiv's*	160	21,222	41	22	0.19%	13.75%
Immunohistochemistry	250	2,556	11	10	0.43%	4.00%
Outgrowth ELISA	174	2,478	3	3	0.12%	1.72%
Serum ACE	14	266	1	1	0.38%	7.14%
TOTALS 2007	**1,301**	**46,354**	**128**	**90**	**0.28%**	**6.92%**

FY 2006 BVD Summary

Test	No. cases	No. samples	No. positives	No. pos cases	Pos. sample rate	Pos. case rate
Ear Notch ELISA	619	16,182	163	73	1.01%	11.79%
Pooled PCR + ELISA to ID indiv's*	75	9,808	5	7	0.05%	9.33%
Immunohistochemistry	418	4,462	46	25	1.03%	5.98%
Outgrowth ELISA	485	9,562	3	3	0.03%	0.62%
TOTALS 2006	**1,597**	**40,014**	**217**	**108**	**0.54%**	**6.76%**
TOTALS FY 2006-08	**4,014**	**124,244**	**453**	**272**	**0.36%**	**6.78%**

* Pooled PCR + ELISA to ID indiv's: This row includes numbers of individual ear notches tested using the pooled PCR procedure plus the ELISA tests necessary to identify individual BVDV-positive animals within the pool. In some cases, there are pools testing positive on PCR in which no individual BVDV-positive animals were subsequently identified through individual ELISA tests. This may reflect cases in which transiently-infected (not persistently-infected) animals were present in the pools.

Pieces and Parts

Extension Publication Spotlight:
1. Reproductive Fertility in Herd Bulls (ExEx 2066); Bull Nutrition (ExEx 2065); and Health of the Herd Bull (ExEx 11024). The herd bull is a crucial component of productivity and profitability in natural-sire cow calf herds. These three companion publications extensively examine bull management, nutrition, and health.

2. Custom Beef Cow Wintering/Dry Lot Cost (Extension Extra 5042). Many beef producers are evaluating feeding costs of their beef cow herds. The information in this publication can be used by those considering entering into a custom feeding arrangement or drylotting cows.

3. South Dakota State and County Demographic Profiles (Bulletin 755). This publication extensively details population trends, race/ethnicity breakdown, agriculture, net income, occupations, and economics for the state and each of South Dakota's 66 counties.

These, and many other, SDSU Cooperative Extension Service publications are available for free at any county extension office, or at http://agbiopubs.sdstate.edu/.

Lemme resigns as dean of College of AgBio. Dr. Gary Lemme has announced that he will leave his position as dean of the College of Agriculture and Biological Sciences at SDSU at the end of fall semester 2008. Lemme, an SDSU alumnus, has held the deanship since 2005.

Dr. Don Marshall, currently associate dean in the college, has been named acting dean. Marshall joined SDSU as a faculty member in the Animal and Range Sciences Department in 1984 and has been associate dean and director of academic programs since 2002. A national search will be conducted for a new dean with the goal of filling the position by July 1, 2009.

Lemme will spend time on special assignments in the following semesters to prepare for a new role in the College of Agriculture and Biological Sciences. He will remain a tenured professor of plant science at SDSU.

Student News - SDSU Veterinary Science Department

The following is a list of the incoming freshmen who have declared a pre-vet major for Fall semester 2008 at SDSU:

South Dakota
Brandon – Brett Daly
Britton – Justin Schneider
Brookings – Heather Simon
Canton – Tadrah Kaskie
Canton – Molly Lems
Colome – Robert Cahoy
Crooks – Olivia Swanson
Dakota Dunes – Katherine Pursell
Hazel – Larame Zimprich
Humboldt – Dustin Ahrendt
Iona – Kayla Talsma
Iroquois – Christopher Schortzmann
Kennebec – Wyatt DeJong
Madison – Alyssa Warns
Oldham – Sarah Hojer
Onida – Kaycee Gebhart
Parker – Gregory Perleberg
Pierre – Elizabeth Bergeson
Pierre – Chelsea Klinger
Renner – Rebecca Anderson
Sioux Falls – Cody Abler
Sioux Falls – Amanda Mitchell
Wagner – Andrew Hall
Watertown – Ana Schweer
Winfred – Melissa Hagemann
Wood – Lisabeth Massingale
Yankton – Caitlin Hicks

Alaska
Fairbanks – Karin Gadilauskas

Minnesota
Beaver Creek – Lyntausha Kuehl
Brainerd – Danielle Schubert
Burnsville – Anne Koepp
Dalton – Amy Mandelke
Edgerton – Ethan Spronk
Holland – Eric Jolitz
Marshall – Carla Kristoff
Medford – Kimberly Arnold
Plymouth – Madeline Meacham
Storden – Ashley Anderson

Nebraska
Gordon – Bailie Mills
Jackson – Melissa Christiansen
Saint Helena – Ross Pinkelman

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SOUTH DAKOTA STATE UNIVERSITY

Animal Health MATTERS

SDSU Veterinary Science Department
Animal Disease Research & Diagnostic Laboratory
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The SDSU Veterinary Science Department conducts research, teaching, professional service, and extension service to South Dakota and the surrounding region. Entities within the department include the South Dakota Animal Disease Research and Diagnostic Laboratory, the Olson Biochemistry Laboratory, and the Center for Infectious Disease Research and Vaccinology.

The South Dakota Animal Disease Research and Diagnostic Laboratory is a full-service, all-species diagnostic laboratory accredited by the *American Association of Veterinary Laboratory Diagnosticians* (AAVLD). The AAVLD accreditation program complies with international expectations for quality diagnostic services under the guidance of the *World Organization for Animal Health (*the *OIE)*. The ADRDL collaborates with the USDA National Veterinary Services Laboratory on many federal disease monitor and eradication programs and is a member of the National Animal Health Laboratory Network. For information regarding the laboratory's Quality System, contact Rajesh Parmar – ADRDL Quality Manager, at 605 688 4309.

Phone: (605) 688-5171 · Fax: (605) 688-6003 · Website: http://vetsci.sdstate.edu

Calendar of Events

November 7-8 - Swine Disease Conference for Swine Practitioners, Scheman Building, Iowa State University, Ames, IA http://www.ucs.iastate.edu/online.htm

December 4-6 - Academy of Veterinary Consultants Winter Meeting, Renaissance Denver Hotel, Denver, CO http://www.avc-beef.org

Dec. 6-10 - American Association of Equine Practitioners. San Diego Convention Center, San Diego, CA www.aaep.org

Dec. 11 - Dairy Producer/Veterinarians Meeting, Midwest Dairy Institute, Milbank, SD, Featuring Dr. Robert Mortimer, Colorado State University http://vetsci.sdstate.edu/vetext

Dec. 12-13 - Wyoming Veterinary Medical Association Winter Meeting, Casper, WY http://www.wyvma.org/

January 30-31, 2009 - Montana VMA Winter Meeting, Bozeman Holiday Inn & BW GranTree Inn, Bozeman, MT www.mtvma.org

Editor: Russ Daly, DVM

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