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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

March 2010



Iraqi veterinarian brings veterinary-and life-experiences to ADRDL

Russ Daly DVM, SDSU

Finding enough work in the veterinary field to support you and your family while finishing your master's degree in medical microbiology would be stressful enough—but try doing it against the backdrop of a war zone. Such have been the challenges experienced by Anwar Sarah, VMD, MS, a pathologist-in-training at the South Dakota State University Animal Disease Research and Diagnostic Laboratory. Sarah, an Iraqi-born and -trained veterinarian, has been assisting pathologists at the ADRDL since April 2009, shortly after arriving in the United States through an interesting chain of friends, acquaintances, and occurrences.

At the time of the US-led invasion of Iraq, Sarah had just finished his veterinary degree from Baghdad University and had started his residency at a general veterinary hospital in Diyala province, near his home. What started out as a busy residency in companion and food animal medicine quickly dried up as the animal case numbers dwindled to nothing following the onset of war in the surrounding area. Sarah then became associated with the US Army as an Interpreter, finding that his command of the English language and knowledge of medical issues and terminology made him a valuable commodity in this time of interaction between US and Iraqi citizens and officials. He served the army as a medical translator from April through October 2003. In the subsequent years, Sarah would find work with several different US



Dr. Anwar Sarah works up a submission as the next case awaits. (Photo: Russ Daly)

civil and Iraqi governmental organizations, serving as a valuable liaison between American personnel and the Iraqi citizens they sought to assist.

In a recommendation letter later written in support of Sarah's immigration to the United States, the major general in charge of Sarah's unit wrote, "(Sarah's) interpreting skills were critical to the success of coalition forces missions throughout his time during Operation Iraqi Freedom. The work that (Sarah) performed was arguably the most dangerous role

possible for a local national interpreter, all of whom leave the protection of U. S. forces when going home to visit family and friends..."

Constant Vigilance

Sarah had sought to further his veterinary education by going to graduate school. Threats to his personal safety from insurgents in his home area also were a factor in his moving to the safer area of Babel province following his initial stint with the US Army. It was there that Sarah joined the College of Medicine at Babylon University in Al Hilla, working as a lecturer in the physiology department and taking graduate coursework in medical microbiology.

During this time, and because of his association with the Army, threats from insurgents were an almost daily occurrence. This meant that Sarah needed to constantly stay vigilant. As a local governance assistant, serving as an office manager for several apart-

ments and an office building that housed the offices of Research Triangle Institute, a USAID contractor, he endured the deaths of several friends at the hands of attacks by insurgents. One day while in Baghdad for a meeting, Sarah received a call informing him that a bomb had likely been planted near his home. A rushed meeting with his cousins and brother, who brought him a suitcase and his passport, ensued.

Iraqi veterinarian

(Continued on page 3)

Director's Message — Tomorrow's Veterinarians and the NAVMEC

David H. Zeman, DVM, PhD

The first of three national meetings of the North American Veterinary Medical Educational Consortium (NAVMEC) were held February 11th and 12th in Las Vegas. What is NAVMEC you may wonder? In their own words:



"During 2009, the Association of American Veterinary Medical Colleges (AAVMC), in looking to the future of veterinary medical education and ensuring that the profession is positioned to meet societal need, organized and

launched the North American Veterinary Educational Consortium (NAVMEC). The Consortium, over a 12 to 18 month period, will hold a series of national discussions on several important questions in planning the future of veterinary medical education, including 1) what is meant by meeting societal needs, and what knowledge, skills, and competencies should all new graduates of veterinary medical colleges possess at graduation to ensure societal needs are met; 2) what are different educational models that will prepare all new graduates to meet societal needs; and 3) what are the essential principles and relationships between colleges, accreditation, and licensure that will ensure that new graduates meet societal needs."

I am fortunate to attend this series of meetings as an advisory panel member; in particular I will be looking out for the interests of veterinary diagnosticians and veterinary researchers. I am also very interested in how all of this may impact our SDSU pre-veterinary medicine program. Our department is an institutional member of AAVMC, and I am proud of AAVMC's leadership in launching NAVMEC to address these critical questions relative to the future educational needs of veterinary medicine. I will follow up with more on this topic as recommendations are developed. I hope you are all surviving the winter thus far. As always, it is a pleasure to serve our diverse stakeholders via the SDSU Veterinary Science Department. ■

Veterinarians With Current USDA Accreditation: Note Program Changes

Beginning on February 1, 2010, the USDA put into effect substantial changes to the veterinary accreditation program. Accredited veterinarians carry out many of the USDA's animal health programs and services, including animal inspections, testing, and certifications. These veterinarians serve as the first line of defense in ensuring the health of the Nation's livestock.

Major changes to the existing accreditation rules include:

1. All accredited veterinarians will need to choose between two categories of accreditation:
 - a. Category I animals -- All animals except: food and fiber species, horses, birds, farm-raised aquatic animals, all other livestock species, and zoo animals that can transmit exotic animal diseases to livestock; or:
 - b. Category II animals -- All animals
2. Renewal of accreditation status by veterinarians must be done every three years.
3. All accredited veterinarians will be required to undergo APHIS-approved continuing education (CE) units prior to future renewals of their accreditation.
 - a. Vets accredited in Category I will need 3 units of CE per renewal period.
 - b. Vets accredited in Category II will need 6 units per renewal period.
 - c. This specific CE will be available online free of charge.
4. Accredited veterinarians will be assigned a random National Accreditation Number to be used on all official

documents requiring an accreditation number.

5. Accreditation status is state-specific. After becoming accredited in one state, a veterinarian can apply for accredited status in others in which they are licensed.

What do veterinarians need to do right now?

1. If you are currently (any time prior to February 1, 2010) accredited, you must complete and submit VS Form 1-36A in order to keep your accreditation from expiring.
 - a. Forms and instructions can be found on the National Veterinary Accreditation Program website at <http://www.aphis.usda.gov/nvap/>
 - b. Veterinarians should consult those instructions regarding specific responses to enter into the form.
 - c. The form must be submitted by August 2, 2010 or else accreditation will expire.
 - d. The form should be submitted to the National Veterinary Accreditation Program, 4700 River Road, Unit 64, Riverdale, MD 20737, or by e-mail to nvap@aphis.usda.gov. Do not send forms to the area office in Pierre.
 - e. No CE is necessary now, but will need to be completed prior to renewing this accreditation in three years.
2. Veterinarians applying for accreditation for the first time, prior to June 1, 2010, will need to complete a core orientation along with Form 1-36A. Veterinarians should consult

Veterinary Accreditation (Continued on page 7)

Iraqi Veterinarian

(Continued from page 1)

Sarah retreated to Syria for two months, putting his studies and research on hold.

Veterinary Medicine in the Middle East

In the underdeveloped Middle East, work as a veterinarian is normally hard to come by. Livestock industries are not developed, and few people have the means or the desire to seek veterinary care for companion animals. Before the invasion, Sarah raised calves and sheep on his family's farm. As a budding veterinarian, he enjoyed formulating rations and administering treatments—notably for lung and liver flukes, contagious ecthyma, internal parasites, and screwworm infestation. Sarah says that the main obstacle to livestock production in Iraq was—and still is—a lack of dependable electricity for operations to feed, water, and otherwise care for more than a few animals.

In wartime, these problems were magnified. Personal security and acquiring life's basic necessities took precedence over animal

care. As such, Sarah found essentially no prospects for gainful employment in the veterinary profession in Syria or upon his return to Iraq.

While veterinarians in the United States enjoy a good deal of respect with the general public and to a certain degree with medical professionals, this is not the case in Iraq, Sarah says. "While starting my master's degree, my advisor [a cardiologist] advised me to not even mention to the other faculty that I was a veterinarian—rather, simply a student pursuing the field of medical microbiology. If I was to mention I was trained as a veterinarian, I would be referred to as a 'donkey doctor.'" During his first project, Sarah had cultivated a connection with the director of the tuberculosis clinic in Najaf, a relationship that went south after Sarah mentioned he was trained as a veterinarian.

Continuing His Studies

Settling with his family (mother, wife, four brothers, and a sister) in Najaf province upon his return, Sarah began commuting by bus back to Babylon University 40 miles one way (1 ½ hours per trip) to continue his studies. In December 2005, with coursework behind him, he began work on his research project analyzing the effect of tuberculosis vaccine on human cellular immunity. As if a daily commute through war zones was not problematic enough, Sarah soon found that the reagents his project depended on would not work properly. A change in research focus was necessary—this time to an analysis of humoral immunity against measles virus—and his MS was complete in December 2008.



Dr. Anwar Sarah

At the same time as his studies and research, Sarah held several positions with civil organizations helping to establish local governance in Iraq. His specialty was serving as a translator, linguist, and eventually a recruiter for these companies. Later he served as a medical field officer in charge of monitoring field hospitals for the central Euphrates region of Iraq.

A New Country, A New Start

Looking to the future for himself and his family, which now included a toddler son, Sarah's cooperation with the US Army afforded him the possibility of immigrating to the United States. In February 2009, Sarah connected with Lt. Col. Lyle LaCroix, the supervisor who first employed him as an interpreter. LaCroix was now back home in Yankton, South Dakota, and offered Sarah a place to stay in the States.

From there, the tight-knit network of South Dakota veterinarians went to work for Sarah in his quest for work and further education. Local Yankton veterinarian Bruce Teachout, then-State Veterinarian Sam Holland, and SDSU faculty member Chris Chase, among others, all played a role in Dr. Sarah learning about and gain-

ing a position at the SDSU ADRDL as a post-doctoral student and pathology resident. Sarah assists a different SDSU veterinary pathologist with cases on a weekly basis. According to David Zeman, Department Head and Director, "The ADRDL is very pleased to be working with Sarah. Veterinary medicine is indeed a global profession and he brings a variety of previous experiences to share with us. He is very enthused about developing expertise as a veterinary diagnostic pathologist—with the goal of becoming a diplomate of the ACVP (American College of Veterinary Pathology)—and is rapidly learning more about the common diseases in our service area."

Gratitude

The overall emotion expressed by this newest resident of Aurora, South Dakota, is one of gratitude. First, for the US liberation of Iraq from the regime of Saddam Hussein. "When Saddam was in power, it was not acceptable for anyone to speak poorly of the government," he says. Sarah lost uncles on both his mother's and father's side of the family to capture by Saddam's forces in retaliation for alleged anti-government remarks. It was not until records were found following the US invasion that Sarah's family was even able to learn of their fate.

But even greater is the sense of gratitude Sarah holds for all who have helped him along the way, including Senator Tim Johnson's office, the LaCroix family, his former supervisors who have written him letters of recommendation, and the people at SDSU and the surrounding community. Currently, Sarah has his mother, his wife, and four-year-old son living with him in Aurora, with hopes of bringing his extended family to America soon. His future plans include gaining access to a formal pathology training and PhD program here in the United States. For now, he is thoroughly enjoying the friendliness, acceptance, and peace experienced here. While he's looking forward to more specialized training in the future, "I really don't want to move from South Dakota," he says. ■

The Virology Section at SDSU's ADRDL

Russ Daly DVM, SDSU

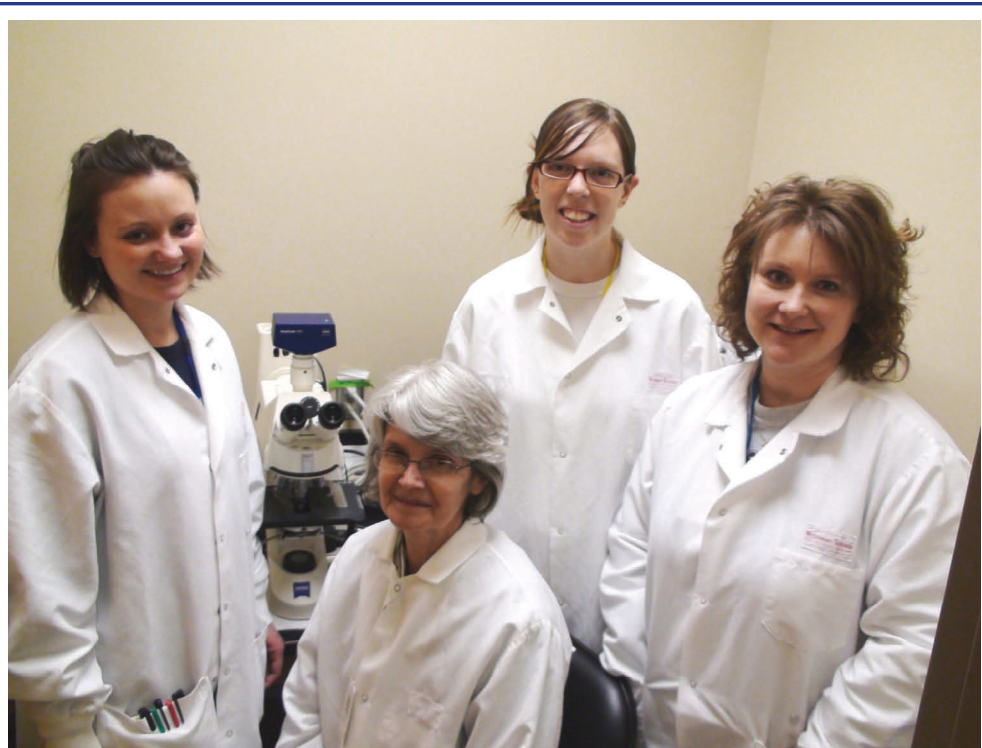
H1N1 Influenza. Bovine Viral Diarrhea Virus. Porcine circovirus. PRRS virus. Viral agents such as these are responsible for many important and emerging disease issues that veterinarians, livestock producers, companion animal caretakers, wildlife biologists and public health experts concern themselves with on a daily basis. The section of the Animal Disease Research and Diagnostic Laboratory (ADRDL) that supports those people in their efforts is the virology laboratory.

While the 535 examinations for rabies performed in FY 2009 likely stand out to most people, the virology section performed over 9,000 different procedures throughout the year. Bovine virus isolation procedures are the most common request, along with Bovine Viral Diarrhea Virus (BVDV) and Infectious Bovine Rhinotracheitis Virus (IBR) fluorescent antibody (FA) tests. But FA procedures looking for evidence of viral infection in samples from swine, horses, cats, dogs, sheep, and wildlife are also common requests.

As an example of the section's adaptability to emerging issues, fish diagnostics have been added beginning in 2008 (see accompanying article). The ADRDL now performs virus isolation diagnostics for Viral Hemorrhagic Septicemia (VHSV), Large Mouth Bass Virus (LMBV), and soon will add a test for Spring Viremia of Carp Virus (SVCV). These offerings were added in order to support the diagnostic needs of the growing aquaculture, bait fish, and ornamental fish industries in the state and surrounding region.

In addition, newer rapid chromatographic immunoassay tests for swine influenza virus and bovine respiratory syncytial virus were evaluated and offered for the first time by the section in 2009.

On a daily basis, the virology section provides diagnostic support to the ADRDL pathologists working up case submissions. But ADRDL researchers



Virology Staff at ADRDL (L-R): Liz Brown, Microbiologist; Pam Leslie-Stein, Assistant Professor and Section Leader; Amanda Murphy, Student Worker, Stacey Wessels, Senior Microbiologist. (Photo: Russ Daly)

are also supported through viral diagnostics for research projects. Other ADRDL sections benefit from virology as well. For example, cell culture lines are provided to the serology section for their use in viral neutralization procedures. The virologists work closely with the molecular diagnostics section as well, and supply materials to many different survey and research studies throughout the country.

A well-trained and experienced staff of three full-time personnel and one student worker oversee and carry out the duties of the virology section at SDSU:

Pam Leslie-Stein MS, Section Leader, Assistant Professor, has over 36 years experience with veterinary diagnostic virology at the ADRDL, and had experience prior to that in the animal vaccine industry. She holds bachelor's and master's degrees in microbiology from SDSU. While all section personnel are

well cross-trained in all of the diagnostic procedures, Pam works with rabies cases and specimens from swine, small ruminant, and companion animal submissions.

Stacey Wessels BS, Senior Microbiologist, obtained degrees in Biology and Microbiology from SDSU also, and has 18 years of experience in the virology section. As a student, she gained experience in microbiology techniques while working as an assistant in Dr. David Francis's laboratory. Stacey has specialized training in rabies diagnostics from the Centers for Disease Control and Prevention and performs many of the bovine virological tests within the section.

Elizabeth Brown, MS, Microbiologist, has been with the virology section for the past year and has served as a research assistant under Dr. Fang. Liz holds a BS in Microbiology, a masters in Veterinary Microbiology, and is currently

Rabies Cases Increase in 2009

The SDSU ADRDL is one of two laboratories in South Dakota that performs rabies testing on animal specimens, with the other in Pierre at the state Department of Health. What had been a declining incidence of animal rabies within the state strongly reversed its course in 2009 with the diagnosis of 53 positive specimens, compared to 24, a historical low, in 2008.

Species	2008	2009
Skunk	16	31
Bat	4	4
Cattle	2	4
Horse	2	2
Dog	-	7
Cat	-	4
Goat	-	1
TOTAL	24	53

Source: SD Dept. of Health. 2009 data is provisional. Data includes SD animals tested at both ADRDL and SD Dept of Health laboratories.

working on her PhD from SDSU. She works closely with fish diagnostics within the section and is responsible for necropsy and preparation of fish specimens, along with formulation of standard operating procedures (SOP's) for fish diagnostics. In addition, Liz works with viral diagnostics of specimens from swine, small ruminant, and companion animal submissions.

Amanda Murphy, Student worker, will graduate this May with a BS in Organismal Biology and a minor in Chemistry, and hopes to attend veterinary school in the fall. Amanda assists with all aspects of the virology section and has a particular interest in fish diagnostics. ■

Fish Health and Diagnostics Update

Regg Neiger, DVM

SDSU ADRDL Fish Diagnostics

The diagnostic laboratory continues to increase its test offerings in the area of fish health. We have recently added and validated virus isolation for LMBV (Large Mouth Bass Virus) and now offer it as well as VHSV for fish health evaluations. We plan to add SVCV (Spring Viremia of Carp Virus) isolation in the near future.

The laboratory also does full work-ups on fish case submissions. This includes pathology, microbiology, clinical pathology, and chemical analysis. Most of our fish submissions are cool water species; however, we have also received ornamental as well as warm water fish this year. If you have any fish health questions please contact Regg Neiger DVM at 605-688-5171.

VHSV in Lake Superior

There was big news lately on the westward movement of the VHS virus. For the first time, VHSV was demonstrated in Lake Superior by researchers at the Cornell University College of Veterinary Medicine and confirmed by the USGS Western Fisheries Research Center in Seattle. Last summer, Cornell investigators collected and tested 874 fish from seven sites in Lake Superior. Using qRT-PCR, fish from four of seven sites were positive for the virus: Paradise, Mich.; Skanee, Mich.; St. Louis, Bay, Wisc.; and Superior Bay, Wisc. The positive species included yellow perch, white sucker, rock bass and bluegill. The detection of the virus in Lake Superior was not completely unexpected, since it is physically connected with other great lakes where the virus was identified in 2005.

The virus has caused large die offs of fish in the Great Lakes. This report is also interesting, because until now, virus isolation has been the gold standard for detecting VHSV. The public announcement of

the presence of the virus in Lake Superior for the first time on just the evidence of a PCR exam is significant.

Wisconsin Fish Importation Requirements Have Changed

The following is a direct quote from an email from Dr Kebus of the DACTP:

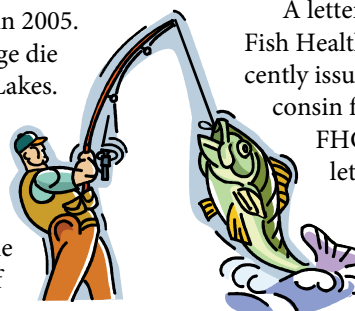
The Wisconsin Fish Health Certificate (FHC) has been revised and beginning **February 15, 2010**, the new certificate form must be used in place of the current version of the FHC. Please destroy all earlier versions. There are major changes in the new FHC:

- The fish health assessment components of the FHC will no longer be required as part of the FHC
- Skin scrape components of the FHC will no longer be required as part of the FHC
- Wet gill mount components of the FHC will no longer be required as part of the FHC.

A visual inspection for signs of contagious or infectious disease by the qualified fish health inspector is still required. The form is available electronically and can now be largely completed on your computer. An original signature remains a requirement. Therefore, the forms must be mailed to the department and cannot be submitted electronically or by fax. An electronic copy of the certificate can be obtained by calling 608-224-4887 or e-mail

beverly.simonds@wisconsin.gov.

A letter will be sent to Qualified Fish Health Inspectors who have recently issued Wisconsin FHCs. Wisconsin fish farms who have gotten FHCs recently will also receive a letter on these changes. ■



Pieces and Parts

VSD Faculty Members Honored at SDSU Faculty Recognition Event

Five members of the SDSU Veterinary Science Department were honored at the annual SDSU Faculty Recognition event, held February 16 on the SDSU campus.

This year's F.O. Butler Award for Excellence in Research was awarded to **Christopher Chase**, professor of veterinary science. The 2009 South Dakota Veterinarian of the Year, Chase has been co-and principal investigator on more than \$7 million in grant funding. A leader in the 2010 Center for Infectious Disease and Vaccinology, Chase was a founder of RTI, a local contract research organization.

Of the three Intellectual Property Commercialization Awards given, two went to faculty groups that included Veterinary Science Department faculty. These awards are given in recognition of the impact faculty research can make through start-up of innovative, high technology companies, boosting economic development in South Dakota.

The grand prize was awarded to Omathanu Perumal, associate professor of pharmaceutical sciences; Satheesh Podaralla, pharmacy doctorate/PhD student; and **Radhey Kaushik**, associate professor of biology/microbiology/veterinary science for inventing a technology that allowed creation of PNST, LLC, the first technology start-up company from SDSU through the technology transfer process. The company uses a natural protein from dry distillers grain to prepare nanoparticles that target tumor tissue with anti-cancer drugs.

Another intellectual property commercialization award went to **Ying Fang**, assistant professor of veterinary science, **Eric Nelson**, professor of veterinary science, and **Jane Christopher-Hennings**, professor of veterinary science, for inventing a method to create a new swine vaccine to prevent spread of the swine disease PRRS. (Source: SDSU University Relations)



ADRDL Assists AIB in Bovine Tuberculosis Diagnostics

ADRDL pathologists and staff (left) consult with South Dakota Animal Industry Board (AIB) veterinarian Marc Hammrich while processing tissue samples from submissions related to two tuberculosis-positive herds found in southeast South Dakota. The ADRDL assisted the AIB with necropsy examinations of 29 different animals. As of press time no further infected herds have been identified by the AIB. (L-R: Student worker Alyssa Hesemann, ADRDL Pathologists Regg Neiger and David Zeman, AIB veterinarian Marc Hammrich (back to camera), and Secretary Margaret Janssen. Photo: Tanya Graham).

2010 Bailey Herd Health Conference a Success

Dr. Chris Chase (right) addresses attendees at the James Bailey Herd Health Conference held February 13, 2010, at South Dakota State University. Over 60 attendees from six states heard experts address the subject of beef cow reproduction and fertility. Speakers included Drs. Dave Steffen, University of Nebraska; Tom Geary, USDA ARS, Miles City, MT; Cody Wright and George Perry, Animal and Range Science Department, SDSU; and Larry Holler and Chris Chase, Veterinary Science Department, SDSU. (Photo: Russ Daly)



Faculty Members Attend "Animal Welfare in Veterinary Education and Research" symposium

Drs. David Zeman and Russ Daly attended the "Swimming With the Tide: Animal Welfare in Veterinary Education and Research" symposium held at Michigan State University in early November. Co-sponsored by the AVMA and the Association of American Veterinary Medical Colleges, the meeting brought together an international audience of experts, educators, and practitioners to discuss the current state of animal welfare education in veterinary and pre-veterinary programs, and also to explore how

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Pieces and Parts

(Continued from page 6)

animal welfare concepts are informed by science, ethics, public perception, and even terminology. Conference highlights included: discussion of the erosion of the status of the veterinary profession in framing the debate on animal welfare issues, the variety of perspectives about what constitutes animal welfare, differing views of animal rights organizations and animal agriculture organizations regarding welfare issues, cultural and international differences regarding welfare issues, and the lack of animal welfare coursework in the professional veterinary curriculum.

The conference highlighted the fact that animal welfare and well-being continue to be important issues shaping the veterinary profession as well as livestock and companion animal caretakers. The educational and research aspects of welfare will be important components in molding the views of future generations of veterinarians and other animal professionals.

Calf Scours Submission Reminders

- History is a significant aid to diagnosis! Whenever possible, indicate **calf age** on the submission form for calf diarrhea cases.
- Make sure to include **colon** in submissions from necropsy cases, in addition to duodenum, jejunum, and ileal portions of the small intestine.
- Well-preserved samples are key to diagnosis for conditions caused by *Clostridium*, colibacillosis, and others. Submit specimens collected and fixed **soon after calf death**, or submit live calves for workup.
- Include **mesenteric lymph nodes** to aid *Salmonella* diagnosis.

Veterinary Accreditation

(Continued from page 2)

the NVAP website for more specific information.

3. Veterinarians who will apply for their first accreditation after June 1, 2010, will need to complete Initial Accreditation Training before being admitted to the core orientation program. Veterinarians should consult the NVAP website for more information.

At this time, the online training programs that will be used for veterinarians applying for renewal of accreditation are not yet available. More information will be forthcoming

as the modules become available.

Please consult the NVAP website at <http://www.aphis.usda.gov/nvap/>, or our local area office (South Dakota: 605-224-6186) for more information.

Sources: USDA-APHIS; AASV; USDA Area Office, Pierre

Calendar of Events

April 8-10

Academy of Veterinary Consultants Spring Meeting

DFW Airport Marriott North Hotel, Irving, TX

<http://www.avc-beef.org>

May 19-21

International Symposium on Beef Cattle Welfare

Kansas State University, Manhattan, KS

<http://www.isbcw.beefcattleinstitute.org/>

June 6-8

SDVMA Summer Meeting

Ramkota Inn & Convention Center, Pierre, SD

Recreation opportunities on Monday include team roping, fishing, golf. CE on Tuesday to include split session on equine topics.

(605) 688-6649 or www.sdvmed.org

June 17-19

Nebraska VMA Summer Meeting

New World Inn, Columbus, NE

<http://www.nvma.org/>

June 20-23

Wyoming VMA Annual Meeting

Little America Resort, Cheyenne, WY

<http://www.wyvmma.org/>

June 27-29

Montana VMA Summer Conference and Trade Show

Helena, MT

www.mtvma.org

August 8-11

South Dakota Veterinary Medical Assn. Annual Meeting

Ramkota Inn, Sioux Falls, SD

(605) 688-6649 or www.sdvmed.org

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Animal Health MATTERS

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.

Editor: Russ Daly, DVM

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