

Sheep & Goat HEALTH REPORT

A National Institute for Animal Agriculture Publication

Summer 2007

Naugle Moves to VS to Work on Scrapie Eradication

The U.S. Department of Agriculture's (USDA) Animal and Plant Health Inspection Services/Veterinary Services (APHIS/VS) has named Alecia Larew Naugle, DVM, PhD, its Associate National Scrapie Program Coordinator. In addition to the responsibilities associated with this position, Dr. Naugle will serve as the national epidemiologist for the program.

A graduate of The Ohio State University College of Veterinary Medicine, Dr. Naugle practiced in northeast Ohio for a year before returning to Ohio State to earn her PhD in veterinary preventive medicine. Dr. Naugle's doctoral program focused on epidemiology, with significant research on Johne's disease in dairy cattle.



Dr. Alecia Larew Naugle

"While working on my PhD, I was also fortunate to work in extension, and I value the bridge between research and producers," Dr. Naugle states.

After earning her PhD and a stint with Food Safety and Inspection Service, Dr. Naugle accepted the Associate National Scrapie Program Coordinator position, coming on board in early March.

"The National Scrapie Program and my research focus on Johne's disease in dairy cattle have definite commonalities," she elaborates.

"Both scrapie and Johne's disease are chronic infectious diseases that have long incubation periods, and both have issues associated with the diagnosis of infected animals.

"I plan to transfer skills honed with ELISA testing in the field for Johne's disease to see how we can build ELISA testing into the scrapie area."

Dr. Naugle's strong agricultural background gives her a hunger to help producers.

"Both producers and USDA/APHIS/VS have the same goal and that is to eradicate scrapie," she states. "I am fortunate to have the position that I have and collaborate with producers. They are the ones who determine the success of the National Scrapie Program." ●

Why Poisonous Plants Sometimes Lethal, Sometimes Not

Sheep and goats love green plants, but not all plants love sheep and goats. But when is this relationship an OK one, and when does it turn deadly?

Research shows that numerous factors influence the action of poisons and the severity of a sheep's or goat's reaction to them. These factors include the amount eaten and over what period of time, the chemical nature of the poison, the part of plant and condition of the plant, the amount of fill in the rumen prior to ingestion of the substance, species of animal poisoned and the general health of the ruminant prior to eating the poisonous plant. Another key influencer is the size, age and sex of the animal.

"We must remember that the dose makes the poison," Sweetlix nutritionist Jackie Nix states. "The amount eaten is critical. With some plant-born chemicals, such as the prussic acid produced in wilted black cherry tree leaves, only a few mouthfuls can be deadly. However, with others, like the glycosides in wild mustard seeds, large amounts must be eaten before symptoms of poisoning appear.

"Every substance on earth is capable of

poisoning animals at a critical dosage, even water. Some poisonous plants must be ingested over a long period of time to cause damage while others cause damage immediately."

Nix points out that the chemical nature of the poison is extremely important when considering poisonous plants. She notes that common poisonous compounds found in plants include glycosides, alkaloids, oxalates, oils, minerals, resins and nitrates. While some of these poisons affect the nervous system, others affect the blood, intestinal tract or the heart.

"Knowledge of the specific poison and its mode of action will aid in trying to treat specific poisoning cases," Nix interjects.

"For example, nitrates sometimes found in Johnson grass or Bermudagrass bind to hemoglobin in red blood cells rendering it incapable of carrying oxygen to the tissues. In acute nitrate poisoning cases, the only way to counteract the symptoms is to reverse this chemical reaction in the blood."

Not every part of a poisonous plant is poisonous, and not all poisonous plants are

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News Briefs

Numbers Confirm Interest in Eradicating Scrapie

Eradicate scrapie! That's the cry of the National Scrapie Eradication Program, with producers and various USDA-backed programs making strides in their efforts to eradicate scrapie in the nation's sheep flocks and goat herds.

A report prepared by the National Center for Animal Health Programs, Ruminant Health Programs, shows that 2,019 flocks were participating in the Scrapie Flock Certification Program (SFCP) as of April 30 of this year. That's 58 more flocks than were participating as of Sept. 30, 2005.

Of the 2,019 flocks in the SFCP, 1,649 were complete monitored flocks, and three were selective monitored flocks. Certified flock numbers have doubled since Sept. 30, 2005: 376 as of April 30, 2007 vs. 188 just 19 months earlier.

Scrapie-infected and source flocks with open statuses totaled 54 as of April 30. Of the 54 flocks, 35 were reported since Jan. 1. The total of infected and source flocks released in FY 2007 was 46.

Of the 149 scrapie cases confirmed and reported by the National Veterinary Services Laboratories (NVSL) this year, 26 are Regulatory Scrapie Slaughter Surveillance (RSSS) cases. Eighteen cases

of scrapie in goats have been reported since 1990, with the last goat case reported in May 2006.

RSSS

The RSSS program has been in effect for four years, with samples collected from 126,084 animals from 154 slaughter plants as of April 30 of this year.

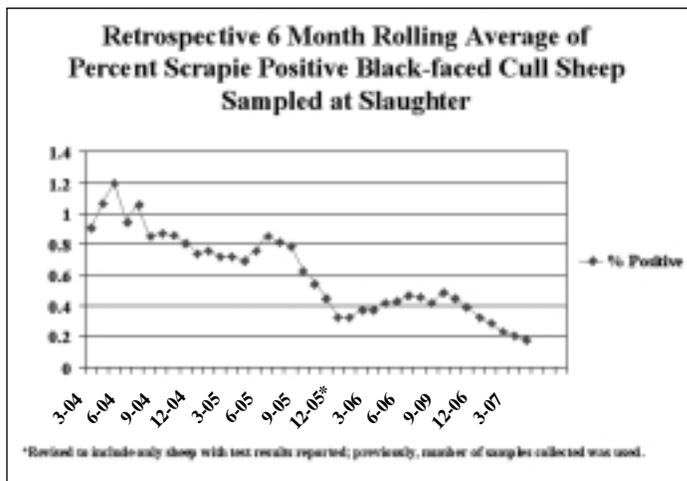
Statistics for FY 2007 include:

- 22,394 total samples—22,383 sheep and 11 goats.
- 26 NVSL confirmed positive cases.
- Face colors of the confirmed positives, 16 black, six mottled, one white and three unknown.

RSSS data show that advancements are being made, with percent of positives the least since the beginning of the program. (See chart above.)

Scrapie Testing

As of April 30 of this year, 24,919 animals had been tested for scrapie. This



includes 22,394 RSSS; 1,737 regulatory field cases; 43 necropsy validations; and 745 regulatory third eyelid biopsies.

Animal ID

Sheep and goat producers continue to register their premises. As of Sept. 30, 2005, sheep and goat premises assigned identification numbers totaled 103,580. As of April 30, 2007, this number had increased by 24,805 to 128,385 assigned identification numbers in the Scrapie National Generic Database. ●

Another Step Toward NAIS Success

A key ingredient in the success of the National Animal Identification System (NAIS) can be found in its partnerships. These alliances include state and federal officials working side by side with industry and producers to create an effective and efficient animal disease traceability program. USDA has recently taken steps to create new relationships that will further support the implementation of the NAIS through a series of outreach meetings with representatives from Historically Black Colleges and Universities (HBCU's), also known as 1890 Land Grant Institutions, and community-based organizations that serve minority and economically disadvantaged producers.

More than 100 representatives from the 1890 institutions, community-based organizations and state agricultural representatives met with USDA officials at a May 16-18 conference on the Virginia State University campus in Petersburg, where they learned more about NAIS and worked to develop and implement NAIS outreach strategies tailored to the needs of minority producers and communities.

"NAIS works best when it is actively shaped by those who participate in the program," stated Bruce Knight, undersecretary for USDA's marketing and regulatory programs mission area.

Dr. Alma Hobbs, Dean of the VSU School of Agriculture, agreed with Knight. "As you begin to work together and forge partnerships, that is the real success," Dr. Hobbs stated. "We are here to support that effort."

Dr. John Clifford, deputy administrator of the USDA/APHIS, underscored the importance of NAIS reaching out to involve groups such as the HBCU's.

"We are here to protect American agriculture," Dr. Clifford stated. He said the purpose of the meeting was "building trust".

This was the first of several meetings that USDA will conduct to provide NAIS education and outreach to representatives of minority groups. Another outreach event is planned later this year to provide information to Native American groups and Hispanic Serving Institutions. ●



Sheep & Goat Health Report

Summer 2007

Sheep & Goat Health Report provides the latest information on issues pertinent to sheep & goat health initiatives, strategies, research and regulatory action. It is a communications initiative of the NIAA Sheep & Goat Health Committee and is produced in cooperation with USDA-APHIS. Reprinting is encouraged.

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Johne's Update—Sheep and Goats

By Dr. Ken Olson, Johne's Education Coordinator

Johne's disease affects all ruminants, but programs and research frequently focus on cattle. While this is still the norm, we are seeing more information targeted to sheep and goat producers. One example is an effort led by the University of Wisconsin-Madison College of Veterinary Medicine. Additional support has come from the Johne's Disease Integrated Program (JDIP), the National Johne's Work Group and the Wisconsin Department of Agriculture, Trade and Consumer Protection.

This effort has resulted in two producer educational "modules" on Johne's disease. One was developed specifically for sheep producers, and the other, goat producers. You can find both "modules" and other educational resources at <http://vetmedce.vetmed.wisc.edu/JDVCP/>. If you go to the "Producer Courses" section, you will find producer modules for various species. They cover basic principles and practical strategies for control and prevention of Johne's disease in sheep and goats. Identified objectives for both courses include having learners become able to explain to others:

1. What causes Johne's disease;
2. How Johne's disease spread;
3. How to prevent Johne's disease in their herd/flock;
4. How to test for Johne's disease;
5. What management practices to use to control infections.

You are invited to take the modules free of charge. However, if you would like a certificate of completion for a course, you will need to register, pay the \$10 course fee, and then pass a quiz to get your certificate. You can take the quiz multiple times in order to pass it, if needed.

An Improved Vaccine Possible?

The website of the Norwegian School of Veterinary Science <http://www.veths.no/default.aspx?id=566> reports on the recently completed doctoral thesis of Olöf G. Sigurðardóttir "Paratuberculosis in goats a study of the uptake of *Mycobacterium avium* subsp. paratuberculosis and pathology of early subclinical infection." The report indicates that the disease primarily affects goats in Norway, thus the work is of special interest there. The research found that "the paratuberculosis bacterium invades the intestine through specialized cells in the mucous membrane of the intestine. These cells are located in regions of the intestine that are important for the immunological surveillance of the intestinal tract. Inflammation with paratuberculosis devel-

ops in these regions and gradually spreads throughout the intestine."

"If future vaccines are absorbed through these same specialized cells, they will be able to initiate local, effective means of defense in the intestine and will therefore be able to protect ruminants against paratuberculosis," says Olöf G. Sigurðardóttir.

This work is likely to complement work of JDIP researchers www.jdip.org. Much of their work is focused on developing faster and more accurate diagnostic tools and improved vaccines. They frequently use sheep and goats in their initial research.

NJWG at NIAA

The meeting of the National Johne's Work Group (NJWG) held during the NIAA Annual Meeting focused on needs and future directions for the Voluntary Bovine Johne's Disease Control Program. The following priorities were identified:

1. Risk Assessments were considered the most critical part of the program. They lay the groundwork for the program and get people working with the program onto farms.
2. It is important that all possible steps be taken to assure the success of the Dairy Producer Survey that will be conducted this summer. The survey will identify barriers to participation in the current Johne's program as well as actions that may encourage participation. Responses are needed from a statistically valid sample of all producers.
3. The National Demonstration Herd project has substantial value that is just beginning to bear fruit. An end date

needs to be set for the program, but it needs to be maintained long enough to complete the data capture and analysis phase of the project.

4. Johne's program representatives should go to producer meetings to get their input on needs.

Through JEI, NJWG and JDIP we will continue to seek additional input on needs and direction for the program and develop a strategy for addressing those needs.

Two other highlights of the meeting were updates on the Johne's "White Paper", which assesses the impact of a more definitive link between Johne's and Crohne's diseases on the dairy industry, being produced by JDIP, and the initial economic analysis from the National Demonstration Herd project. PowerPoint slide sets from meeting presentations may be found on the JEI site www.johnesdisease.org.

JEI Website

The JEI website www.johnesdisease.org continues to be updated as new information becomes available. Recent additions include added states with "program herd" (or test-negative herds) information and updates on state Johne's contacts. Plans are being made for a Johne's Interest Group discussion at the Joint Meetings of the American Dairy Science Association and the American Society of Animal Science that will be held July 8 – 12 in San Antonio, TX. The session will be held on Tuesday afternoon, July 10 from 5 to 6 PM in room 216 B of the Convention Center. Watch the JEI site for details on this meeting and on other Johne's news. ●

FFA to Assist with NAIS Implementation

The U.S. Department of Agriculture has entered into a cooperative agreement with the National FFA Organization to advance the implementation of the National Animal Identification System (NAIS). FFA will use the cooperative agreement funds to develop and provide NAIS education programs for their current and alumni members as well as promote premises registration across the country.

The National FFA Organization stepped up to the plate with a proposal after the USDA announced in February that up to \$6 million was available for cooperative agreements to promote NAIS and increase participation in premises registration.

"The youth involved in the National

FFA Organization are the future of agriculture in the United States," said Bruce Knight, undersecretary for USDA's marketing and regulatory programs. "By ensuring the success of NAIS, we are ensuring their future as farmers."

Dr. Larry D. Case, FFA chief executive officer and national FFA advisor, was equally as enthusiastic about the agreement.

"Together we can combine our talents and resources to educate the agriculture industry about NAIS and to help premises registration," Dr. Case stated.

The National FFA Organization, formerly known as the Future Farmers of America, has 495,046 student members that are part of 7,242 local FFA chapters in all 50 states, Puerto Rico and the Virgin Islands. ●

Clifford Reports NAIS Progress to NIAA ID Committee

The U.S. Department of Agriculture's (USDA) Animal and Plant Health Inspection Service (APHIS) Veterinary Services Deputy Administrator Dr. John Clifford, said



Dr. John Clifford

the implementation of the National Animal Identification System (NAIS) was making "excellent progress," citing the fact that nearly 380,000 (397,000 as of June 8, 2007) premises had been registered and 14 animal tracking databases (ATDs) and an animal identification numbering (AIN) system are in place.

Dr. Clifford opened the program for the Animal Identification and Information Systems Committee meeting at the NIAA annual meeting in Sacramento in early April.

Dr. Clifford reported that a grant had been awarded to the National Pork Board to register swine premises (see story on page 3) as part of a \$6 million fund established for non-profit organizations to conduct premises registration, outreach and education. He encouraged other organizations to apply for grants at www.grants.gov.

He also noted that a Tribal Premises Registration System is now available.

Official ID devices have been defined

by USDA, according to Dr. Clifford, with "minimum performance standards and must have on it an AIN, the U.S. Shield and the words 'Unlawful to Remove' imprinted on each device." In addition, radio frequency identification (RFID) devices are allowed.

Regarding RFID devices, he said, "The USDA retains its policy of being 'technology neutral' and relies on industry to recommend ID methods, performance requirements and technology standards."

Dr. Clifford said that APHIS was in the process of printing specifications for sow tags for swine producers and that the Equine Working Group had recommended RFID devices using ISO 11784/85 standards. Also, manufacturers' applications for RFID injectable transponders for use in horses are now being accepted.

While Dr. Clifford emphasized that APHIS will participate in industry initiatives to facilitate standards for emerging, developing technologies, he also discussed one of the oldest technologies used for animal ID. "Brands have always been a part of animal ID in this country. They are often an asset to our disease eradication programs such as tuberculosis and brucellosis, and they will continue to be," Dr. Clifford declared. He said that an official Branding Group had been established and is working to develop how that system can be adopted for NAIS purposes.

Dr. Clifford also reported on the status of the private and State Animal Tracking Databases (ATDs) and USDA's Animal Trace Processing System (ATPS). Working with

states and industry, USDA developed the ATPS which establishes the communication and messaging system with the ATDs for animal health officials to use in disease events when animal movement data is needed. In addition, states and industry collaborated on the development of the technical specifications for integration of ATDs with the ATPS. USDA released a document outlining those technical specifications on February 1. USDA is now establishing formal cooperative agreements with interested organizations whose systems meet the technical requirements.

He concluded by reiterating the fact that access to the data through the ATPS is restricted to the following situations:

- An indication (suspect, presumptive positive, etc.) or confirmed positive test of a foreign animal disease;
- An animal disease emergency as determined by the Secretary of Agriculture and/or State Departments of Agriculture; or
- A need to conduct a traceback/traceforward to determine the origin of infection for a program disease (brucellosis, tuberculosis, etc).

In the question and answer session which followed the formal presentation, Dr. Clifford once again emphasized the point that NAIS would remain voluntary on the federal level and that with the databases being in private or state hands, producers could be assured that their data would remain confidential. ●

Search Narrowing for National Bio-Defense, Agro-Defense Facility

A dozen states submitted bids for a proposed 520,000-square-foot National Bio- and Agro-Defense Facility (NBAF) that would replace an aging, smaller lab at Plum Island, N.Y. Although the winning state will not be announced until October, 2008, Department of Homeland Security officials narrowed down their options in July to five sites: Flora Industrial Park, Madison County, Mass; Kansas State University, Manhattan, Kan.; Texas Research Farm, San Antonio, Texas; Umstead Research Farm, Granville County, N.C.; and University of Georgia/South Milledge Ave., Athens, Ga.

States submitting bids included Texas, with four sites; Georgia, Kansas and Mississippi, each offering two sites; and California, Oklahoma, Maryland, Missouri, North Carolina and Wisconsin with one site each. Kentucky and Tennessee worked together for one site in Kentucky.

Although states' written bids were not made public, states were required to make available at least 30 acres of land.

The narrowing process included visits by federal officials to the 17 potential sites. The government reports that it considered several factors before making its decisions.

The main factors are site proximity to research and research capabilities, acquisition/construction/operations, and community acceptance. The DHS preferences include in-kind contributions such as offers of roads, cheap water supplies and discounted utilities.

The goal is to have the facility built and the lab operational by 2014.

Disease Priorities

Dr. John Vitko, Director of the Homeland Security Department's Chemical and Biological Division in its Science and Technology directorate, said the

NBAF will provide modern, safe, secure, state-of-the-art biocontaminant facilities to study and develop countermeasures for foreign animal and zoonotic disease. Zoonotic diseases of interest include foot-and-mouth disease, classical swine fever, African swine fever, Rift Valley Fever and Nipah and Hendra Viruses.

The new laboratory will also have BSL-3 space which will contain the organisms in the facility and BSL-4 space which will provide additional protection for the researcher against agents which can infect humans. It will be the only laboratory in the country that will have BSL-4 space designed to accommodate large animals so high consequence zoonotic agents that infect both large animals and humans can be studied.

The Homeland Security Department facility is estimated to cost at least \$450 million to build and promises at least 300 lab-related jobs. ●

Shortage of Food Animal Veterinarians: A Call to Action

A year ago the Spring/Summer 2006 Sheep & Goat Health Report featured an article, "Projected Serious Food Supply Veterinarian Shortage Poses Threat to Industry, Society," that provided an overview of the Food Supply Veterinary Medicine Coalition Report conducted by Kansas State University's College of Business Administration on behalf of various veterinarian organizations. The article noted that, while America's livestock and meat industries have one of the world's best health and safety records, this status "may be threatened in the years ahead because of a projected severe shortage of food animal veterinarians."

Research findings were also published in three articles in the June 1, June 15 and July 1, 2006 issues of the Journal of American Veterinary Medical Association (JAVMA).

Mainstream media, including the Associated Press Wire, New York Times and the Brownfield Network, picked up the information and relayed it to the American public at the time. This spring, the story of the shortage of food animal veterinarians came alive again with a second round of mainstream media in the United States and outside the country.

A headline in the International Herald Tribune read, "Health experts in U.S. say shortage of farm animal veterinarians could lead to disease outbreaks." The first two sentences of the article expanded on the headline: "Public health experts are concerned that a shortage of farm animal veterinarians in the U.S. could lead to disease outbreaks, potentially endangering human health and threatening the nation's food supply. The American Veterinary Medical Association estimates the shortage at a relatively small 4 percent. But health officials say even the small gap increases the potential for diseases to go undetected."

In the same article, Dr. Lyle Vogel, director of the animal welfare division at the AVMA, was quoted, "It's not like the other 96 percent can pick up the slack. Because of the distances and workload of the remaining veterinarians, they just can't fill in that shortage."

Likewise, Robin Schoen, director of the Board on Agriculture and Natural Resources at the National Academy of Sciences, noted that, "We're kind of weakening the whole system. The veterinarian is the front line."

More to Tell

Why is the U.S. media returning to the food animal veterinarian shortage?

"The reason for the second round of media attention is that the problem has not been solved," Dr. Vogel states. "The shortage still exists, and we believe state and federal legislatures should take action to help solve this shortage."

Dr. Vogel says one desired action is for Congress to appropriate money for debt forgiveness or loan repayment for new veterinarians who set up practices or work in the under-served rural areas. He points out that the National Veterinary Medical Service Act was passed in January 2004 but the dollar amount available is extremely low: \$500,000 in 2006 and 2007.

"This is simply not adequate assistance to make that program meaningful," Dr. Vogel elaborates.

According to a 2006 survey, the mean starting salary for veterinary graduates was \$45,546. The mean loan debt for the same graduates was \$105,805. Loan payments on that amount of debt is more than \$1,000/month, requiring average veterinary graduates to spend up to one-third of their monthly salaries on educational debt. The National Veterinary Medical Service Act authorizes the Secretary of Agriculture to establish a loan repayment program for veterinarians who agree to serve in areas of need, including government service. Yes, agencies such as the Animal and Plant Health Inspection Service and Food Safety and Inspection Service in the USDA also have experienced difficulty recruiting veterinarians to satisfy staffing needs.

In exchange for additional debt repayment, eligible students could enter into additional agreements with the Secretary to assist the USDA in addressing disease outbreaks, bioterrorist threats or similar emergency situations.

Another reason cited by Dr. Vogel for keeping the shortage of food animal veterinarians "alive" in the mainstream media is to get the public support of federal legislation regarding The Veterinary Public Health Workforce Expansion Act (VPHWEA).

The Association of American Veterinary Medical Colleges has been working very closely with the staffs of Senator Wayne Allard (R-CO) and Congresswoman Tammy Baldwin (D-WI) concerning the introduction of a veterinarian workforce expansion. Their bill is

similar to the Veterinary Workforce Expansion Act of the last Congress with a few improved changes that the AAVMC has requested.

This legislation establishes a competitive grant program through the United States Department of Health and Human Services to build capacity in veterinary medical education and expand the workforce of veterinarians engaged in public health practice and biomedical research.

"We urge people to get involved and call their Congressmen and state legislators," Dr. Vogel states. "Your calls can have an impact and help spur the government into positive action."

Smith-Kilborne Program

In response to the food animal veterinarian shortage, USDA/APHIS resurrected the Smith-Kilborne Program. The program acquaints chosen veterinary students with various foreign animal diseases which potentially threaten our domestic animal population. Upon completion of the course, participating students are asked to share their new knowledge with others at their respective veterinary schools.

The week-long program admits one student from each of the nation's 28 veterinary schools, with the USDA paying for each student's program-related expenses, including tuition, meals, lodging and travel to and from the program. This year's professional development training program was conducted May 29-June 5.

Smith-Kilborne Program classroom sessions were conducted at Cornell University in Ithaca, N.Y., with presentations and laboratory sessions conducted at the Plum Island Animal Disease Center, Plum Island, N.Y.

"This program is one-of-a-kind and covers topics in greater detail and scope than the students would get in their university programs," states Jason Baldwin, DVM, staff veterinarian, Professional Development Staff of USDA/APHIS/VS.

"The Plum Island sessions are invaluable, as Plum Island is the only place in the country where these students will see diseases such as foot-and-mouth disease and Newcastle disease. Acquainting the students with the symptoms of diseases such as this is important because, once the students enter practice, they will be our first line of defense."

Not All Masses in Goats are Contagious Abscesses

Most goat owners assume that all external masses in goats are contagious abscesses caused by *Corynebacterium pseudotuberculosis*. Although this bacteria leads to a significant number of herd infections, not all masses are abscesses and not all abscesses are contagious.

Determining the correct origin of an external mass requires a detailed history, thorough physical examination and aspiration or biopsy. Once the correct diagnosis has been made, an appropriate therapy can be chosen and prognosis for recovery determined.

Numerous bacteria live on the surface of healthy skin and mucous membranes and can be introduced into body tissues through small ulcers or puncture wounds. Coarse hay, grass awns, wood splinters, used injection needles and trauma introduce bacteria into tissue. Once inside the body and deprived of oxygen, bacteria replicate rapidly, destroy healthy tissue and attract white blood cells to fight infection. Fibrous connective tissue surrounds the infection to prevent its spread throughout the body. In most cases the immune system functions properly to destroy the bacteria, and the abscess is either resorbed or breaks through the skin to the outside. Some abscesses interfere with body functions due to their location or size and may need to be surgically drained or removed.

In order to select an appropriate treatment, the cause of the abscess should be determined by bacteriologic culture. The skin is clipped and aseptically prepared, and the aspirated sample should be refrigerated until delivered to a diagnostic laboratory for culture.

Abscesses caused by common bacteria such as *Staphylococcus*, *Streptococcus* or *Pasteurella* usually do not require treat-

ment unless the goat shows symptoms of systemic involvement such as swelling, anorexia or fever. Lancing superficial abscesses caused by common skin bacteria may shorten the course of the disease and yield a more cosmetically pleasing scar. This type of abscess commonly occurs around the mouth, lips, cheeks and injection sites, and does not spread between animals.

Abscesses caused by *Corynebacterium pseudotuberculosis* spread from one animal to another and are referred to as caseous lymphadenitis. These bacteria are found in the thick pustular discharge from ruptured abscesses and can survive for many years in contaminated soil, barns and on equipment or instruments.

While the bacteria may find easy entrance into the body through wounds, they may also penetrate intact skin. *C. pseudotuberculosis* produces a toxin called phospholipase D that allows it to spread from lymph node to lymph node throughout the body. The immune system tries to encapsulate the infection with layers of connective tissue, but the enzyme allows the bacteria to escape. The vast majority of lesions begin in the head and neck and then travel to internal lymph nodes around the lungs, heart, liver, kidneys and small intestine.

Corynebacterium abscesses frequently increase in size with age and interfere with body function. Because these abscesses interfere with normal organ function, caseous lymphadenitis is the most common cause of wasting or chronic weight loss in goats.

Goats infected with *Corynebacterium* are permanently infected and shed the organism in body fluids, abscess contents and coughed aerosol droplets.

One study indicated goats can develop clinical disease within three months

of exposure, and the organism can be spread from open abscesses for as long as three weeks.

Careful interpretation of the SHI test at the University of California, Davis may be useful in determining which animals in an infected herd have internal abscesses. Herds infected with caseous lymphadenitis should work to eliminate the disease through culling affected animals, careful screening and isolation of purchased animals, and raising young stock away from adults on a pasteurization program.

Colorado Serum Company produces two sheep vaccines, Case-Bac and Caseous DT, for use in infected sheep flocks. The manufacturer recommends two doses of two milliliters administered subcutaneously in the axillary space two weeks apart, followed by a single annual booster. The company suggests that the vaccine should be used only in herds that currently suffer from caseous lymphadenitis or those that are at extreme risk for infection.

Because this vaccine is not labeled for use in goats, goat producers who use these vaccines in goats do so at their own risk, as reactions have been reported when the sheep vaccine was used in goats. Careful physical examination, aspiration and biopsy can be used to determine the cause of external masses in goats. Accurate diagnosis can lead to correctly chosen treatment and prevention programs. Although not all causes of external masses can be prevented, their incidence can be markedly reduced through good management practices. ●

This article was submitted by Dr. Joan S. Bowen, DVM, who practices in Wellington, Colorado.

Veterinarian Shortage (continued from page 5)

New 18-Month Study

April 19 marked the first meeting of a National Academy of Sciences expert committee formed to study the broad scope of issues related to the veterinary workforce in the United States. The study, *Assessing the Current and Future Workforce Needs in Veterinary Medicine*, will explore historical changes in the size and characteristics of the veterinary workforce, assess the demographics and ade-

quacy of the current supply of veterinarians in different occupational categories and sectors of the economy and identify incentives, disincentives and other factors that could affect the numbers of veterinarians seeking jobs in different sectors in the future.

The study will also examine trends affecting the kinds of jobs available to veterinarians and assess future demand for veterinary expertise in existing and

new employment sectors. In addition, the study will look at current and future capacity of universities and colleges to provide sufficient numbers of adequately trained veterinarians and identify training needs relative to the demand for specific expertise.

A report will present the findings of the 18-month study and identify options for meeting requirements for a veterinary workforce. ●

News Briefs News Briefs News Briefs News Briefs News Briefs News Briefs

Dr. Ron DeHaven Named Executive Vice President of AVMA

Dr. Ron DeHaven has been named executive vice president of the American Veterinary Medical Association, succeeding Dr. Bruce Little who retired. Dr. DeHaven steps into the position after having served as the USDA's top animal health official. He began his career with APHIS in 1979, then was named to lead APHIS in April 2004. Although Dr. DeHaven accepted the AVMA position in late March, he remained at APHIS for a



Dr. Ron DeHaven

few months to attend the 75th General Conference of the World Organization for Animal Health, May 20-25, in his governmental role and to complete several projects.

Smith Takes New Role at USDA/APHIS

Cindy Smith has been appointed the USDA's Animal and Plant Health Inspection Service's new associate administrator. In her new role, Smith will assist in managing one of USDA's most multifaceted agencies, charged with defending America's animal and plant resources from agricultural pests and diseases. In making the announcement, Dr. Ron DeHaven, administrator for USDA/APHIS, acknowledged Smith's 28-year career at APHIS and her commitment to "public service, vast

knowledge of agency activities and dedication to protecting American agriculture."

Processing Plant Regulation Change

"Limited" and "minimal" inspection programs have been suspended by the U.S. Department of Agriculture's Food Safety and Inspection Service (FSIS), with FSIS now inspecting all lamb processing establishments at least once per shift. FSIS Notice 22-07, "Elimination of 'Minimal' and 'Limited' Inspections," cancels Part 6 of the Meat and Poultry Inspection Manual. The "limited" and "minimal" inspection programs were implemented at qualified processing plants in the 1970s due to staffing shortages, with inspections performed on a less than per-shift basis.

Poisonous Plants (continued from page 1)

poisonous every day of the year. For example, Nix notes that black cherry leaves are only poisonous when they are in a wilted state. The same leaves are perfectly safe when fresh and green or when brown and dried. On the other hand, she says that all parts of some plants, such as Jimsonweed, contain poisonous compounds.

In a pasture filled with animals one question begs to be asked: If all animals consume the same species of poisonous plant, why do some sheep or goats get extremely ill while others don't exhibit the same degree of illness?

Nix attributes this difference to animals having a full stomach or an empty one when ingesting the poisonous plant.

"In many instances, goats with a full stomach will be less susceptible to poisoning than those with an empty one under similar conditions," she states. "The reason is that rumen contents can act to dilute the poisonous compounds and to slow down their absorption."

Plants and Species

Poisons do not affect all species equally. Research and practical experiences confirm that some species are more susceptible to certain poisonous compounds than others.

"This susceptibility or non-susceptibility may be due to different grazing preferences and habits or also different physiological factors," Nix relates. She adds that pigs

and sheep are most susceptible to the fruits of the Chinaberry tree while goats, chickens, ducks and cattle are less susceptible.

"The sex, size and age of the goat are also important factors," Nix continues. "Size is important in that a mouthful of poisonous plant will affect a smaller goat more than a larger goat because the dose of poisonous compound per pound of body-weight will be larger in the smaller goat.

"Since bucks are often larger than does, bucks would be less susceptible from a size stand point. However, since bucks are dominant to does and often get the lion's share of the feed, bucks can be more susceptible in some situations. For example, if Rhododendron cuttings from a yard are thrown to a group of goats, the buck may eat the largest share and be most susceptible to poisoning."

Contrary to popular belief, sheep and goats do not innately know which plants are poisonous and which are not. Nix contends that sheep and goats learn this knowledge through the social interactions of the herd.

"In the wild, every goat eats the same kind of plants at the same time as the dominant or head goat in the herd," she elaborates. "Young kids learn what forages are edible by mimicking older, more dominant goats. If kids are not allowed to interact with older goats, the flock can be susceptible to poisoning."

"With only a few exceptions, most

adult goats will not eat poisonous plants unless forced to do so by unusual or artificial conditions. The first means of controlling plant poisonings then is to prevent the following conditions from occurring."

Symptoms

Nix stresses that symptoms of poisoning are variable and are usually not specific for a particular plant.

"Unfortunately, the first symptom noticed may often be a dead goat," she continues.

Some symptoms of plant poisoning among sheep and goats include frothing at the mouth, vomiting, staggering, trembling, crying for help, rapid or labored breathing, convulsions and sudden death.

Nix advises producers who observe any of the symptoms and suspect poisoning to remove the goat or sheep from the area and to look around the area and try to figure out what poisoned the animal. Another first step is to call a veterinarian as soon as possible.

She also urges producers to remove the poison from the animals by placing two tablespoons of salt on the back of the animal's tongue to induce vomiting. Another method is to administer charcoal tablets and re-hydration fluids along with some mineral oil. She says the charcoal will bind some of the toxins, the fluids will prevent

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dehydration, and the oil will coat the gastrointestinal tract and prevent foaming.

Be Proactive

To protect animals from poisoning, the Agricultural Research Service information suggests producers follow eight steps:

- Learn to identify the poisonous plants that grow on your range.
- Learn the conditions under which these plants can be dangerous to your livestock.
- Develop a grazing plan to improve your range and prevent poisoning of your livestock by plants. Graze your ranges at the proper time. Do not overgraze them.
- Do not allow animals that have been under stress or that are overly hungry to graze in areas infested with poisonous plants.
- Provide adequate water for your livestock.

- Be especially careful when grazing newly introduced livestock on your range.
- Provide adequate salt and other supplements as needed.
- Control poisonous plants where feasible.

Nix adds that providing a nutritionally balanced diet for sheep and goats will prevent them from seeking out harmful plants in search for nutrients.

"Good mineral nutrition will help produce healthy goats and sheep that will be less likely to consume poisonous plants and also more likely to survive accidental poisoning than unthrifty goats and sheep," Nix summarizes.

Dr. Joseph DiTomaso of Cornell University has compiled a list of plants reported to be poisonous among animals in the United States. To check out this list, visit <http://wric.ucdavis.edu/information/poisonous.pdf>. ●

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