

Animal Health News



News for Veterinarians from the North Dakota State Board of Animal Health

Scrapie can be identified in early pre-clinical stage

Scrapie is a novel type of transmissible disease of sheep, presumably caused by an abnormally folding of the protein PrP.

The abnormally folded protein (now termed PrP-Sc) accumulates silently in lymph nodes of U.S. sheep during the 2-5 year incubation period and is found in association with the hallmark scrapie lesions (astrocytosis, gliosis, and spongiform change) in the brain during the clinical period. Minor differences in the PrP protein found naturally in sheep are associated with major differences in susceptibility to scrapie.

Studies from Britain, the Netherlands, Ireland, Iceland, Japan, and France have implicated only two key areas in the normal protein sequence across all breeds; these areas include amino acids at codon 136 and 171. In 1994, Westaway et al. reported the association of clinical scrapie with only a single genotype, QQ 171, in U.S. sheep. Subsequent archival studies published by O'Rourke et al. in 1996 and 1997 confirmed that clinical scrapie was found in U.S. sheep with the 171QQ genotype and not in the alternative genotypes 171QR or 171RR.

With subsequent advances in diagnosis, sheep in the early preclinical stage of scrapie can now be identified. Under federal and state scrapie eradication programs over the last five years, large numbers of clinically normal sheep in flocks with a history of scrapie have been tested to further examine the role of PrP genetics in scrapie. To date, post-mortem tissues from 890 sheep removed from infected flocks have been evaluated by the Agricultural Research Service (ARS) of the U.S. Department of Agriculture.

ARS reports that 58 percent of the sheep were of the highly susceptible genotype QQ171, while the remainder have the alternative genotypes QR/RR171. Of the 513 sheep with the QQ171 genotype, 102 (20 percent) had detectable PrP-Sc in lymphoid tissues, indicating infection with the scrapie agent. The remaining 377 QR/RR171 sheep lacked the susceptible genotype and none of these sheep had tissues positive for PrP-Sc.

In addition, recent reports from the U.S. and France indicate that the lack of a susceptible genotype protects lambs even before birth. PrP-Sc is abundant in the placenta of infected ewes only if the fetus has the susceptible genotype QQ171; placental tissue from the 171QR fetus does not accumulate detectable PrP-Sc, even in dams with advanced clinical scrapie.

Material for this article was acquired through the Agricultural Research Service.

More information

For a more detailed explanation of the cooperative federal-state-private sector program to eradicate chronic wasting disease from captive elk herds in the U.S., see:

www.aphis.usda.gov/vs/cwd_program.htm

Feds propose CWD program for farmed elk

Interstate shipment of farmed elk would be controlled through certificates of veterinary inspection, if the federal government adopts a proposed program to eradicate chronic wasting disease (CWD) from captive elk herds in the U.S.

The program affects only elk that are privately or publicly owned within a perimeter fence or confined space, including "farmed," "ranch," "game farmed," or owned by zoos and other public or private captive entities. The program does not cover other cervids, such as deer and moose, or free-ranging elk.

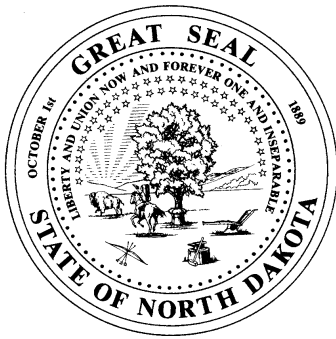
Under the program, states would design CWD certification programs for their own elk owners. State programs would meet or exceed minimum USDA/APHIS criteria and could be mandatory. USDA/APHIS and the states would collaborate with American Indian tribal authorities to implement programs on reservations.

Existing state CWD programs and participating owners would be grandfathered

Continued on page 2

Inside

News briefs	2	Texas to lose TB-free status	6
Veterinarians on the front line	3	BRD – Feedlots No. 1 enemy	7
Cancer care for pets	4	FDA bans nitrofurans use	8



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**THE NORTH DAKOTA
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Francis Maher, Menoken
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DEPARTMENT OF AGRICULTURE**

Roger Johnson
Agriculture Commissioner

Dr. Larry Schuler
State Veterinarian

Dr. Susan Keller
Deputy State Veterinarian

Please send all correspondence
to the State Veterinarian
State Board of Animal Health
N.D. Department of Agriculture
600 E. Boulevard Ave., Dept. 602
Bismarck, ND 58505-0020
PH: (701) 328-2654
(800) 242-7535
Fax: (701) 328-4567



Ted Quanrud, Editor

Veterinary news briefs

Upcoming meetings

- June 19 – North Dakota Nontraditional Livestock Advisory Council, 9 a.m., Roosevelt Park Room, State Capitol, Bismarck.
- June 26 – North Dakota State Board of Animal Health, 9 a.m., Roosevelt Park Room, State Capitol, Bismarck.
- July 13-17 – American Veterinary Medical Association, annual convention, Nashville, TN.
- Sept. 26-28 – American Association of Bovine Practitioners, 35th annual conference, Madsion, WI.

Feds propose CWD program

Continued from page 1

into the federal program if they meet the minimal requirements. Dr. Larry Schuler, North Dakota state veterinarian says he believes North Dakota's mandatory surveillance program, in effect since 1998, will meet or exceed federal requirements.

The herd certification program standards would include perimeter fencing requirements; surveillance based on testing of all deaths over 16 months of age, including surveillance at slaughter; physical herd inventory with annual verification; mandatory death and sold animal reporting and documentation of all interstate movement of captive elk, and detailed descriptions of the premise locations and physical facilities.

Herd status is based on the date of official enrollment in the program. Five years after enrollment with no evidence of CWD, the owner obtains "certified" status. Once the herd is certified, slaughter surveillance will no longer be required, but other requirements of the program will remain in force. If animals are acquired from a herd with a later date of enrollment, the receiving herd reverts to the enrollment date of the sending herd. If a herd participating in the certification program acquires animals from a non-participating herd, the receiving herd must start over with a new enrollment date.

If a positive animal is identified in a herd, the state will impose an immediate quarantine and the herd status is changed to positive. Development and implementa-

tion of a herd plan will determine future eligibility to re-enroll in the program.

- Positive herd - A herd in which a CWD positive animal resided at the time it was diagnosed and which has not been released from quarantine.
- Suspect herd - A herd for which laboratory evidence or clinical signs suggest a diagnosis of CWD, but for which laboratory results have been inconclusive or not yet conducted.
- Exposed herd - A herd in which a CWD positive or exposed animal has resided 60 months prior to the diagnosis of CWD.
- Trace-back herd - An exposed herd in which a CWD positive animal resided in any of the 60 months prior to the diagnosis.
- Trace-forward herd - An exposed herd that has received exposed animals from a positive herd within 60 months prior to the diagnosis of CWD in the positive herd.

In any of these cases, measures must be specifically tailored to eliminate possible further transmission of the disease.

Herd plans will be developed for any CWD positive, exposed, or suspect herds. These plans will be developed by state and federal officials in conjunction with the owner and will be subject to approval by the state veterinarian. Herd plans would outline steps to be taken as a response to identification of a suspect, CWD

Continued on Page 7.

Animal Health News

Veterinarians on front line against biological warfare

By Dennis McLaughlin

There are a couple of connections that tie bio-terrorism to the veterinary profession. Not in *that* way! Veterinarians are not the perpetrators; on the contrary, they are being called on to form the frontline of resistance. Anthrax, one of the thrifty terrorist's likely choices in weapons of mass destruction, is an animal disease. So veterinarians are inherently involved with it as they detect it, treat it, study it and try to prevent it. A few years back, it was a veterinarian in New York who raised the flag about the West Nile disease.

Interestingly, anthrax gets its name from the word *anthracite* because, in the case of cutaneous anthrax, it turns infected skin into hardened black carbuncular tissue that looks like a piece of coal. Anthracite, you may remember from seventh grade science, is a "hard, clean burning coal having high carbon content and little volatility." That's a pretty good description of how anthrax attacks its victims. It works efficiently, often without detection and with little volatility, until it manufactures the toxins that make its deadly outcome irreversible.

Richard Ford, DVM, talking at this year's North American Veterinary Conference in Orlando, took the anthracite analogy a step farther describing the medical community, in particular veterinarians, as "the canaries in the coal mine." Canaries were sent down mine shafts to detect build-ups of toxic gases and warn miners to get out of or stay away from harm's way. Ford, a professor at the veterinary school at North Carolina State University, is also a brigadier general in the U.S. Air Force Reserve. Since Sept. 11, he has been wearing his Air Force uniform more than his scrubs or lab coat. In fact, it is a toss-up about whether he has been spending more time in the classroom or at the Pentagon.

One thing for sure is that, as the highest ranking veterinarian in the U.S. armed forces, his view on the encroaching danger of bio-terrorism is first hand, and his perspective is shaped by frequent consultation and briefings with Cabinet members, the CIA, the Armed Forces Medical Intelligence Center, the Defense Department Intelligence Agency and other government operations. According to Ford, the threat of terrorism, biological or otherwise, is in military parlance "no longer forward-deployed". In other words, it is not restricted to other parts of the world. The battlefield has changed, and he says many officials in the state, defense and public health departments of the federal government have had to change the way they think. Until September "the focus had been to respond effectively to catastrophic situations in other countries," he points out. But now the spotlight is pointed to the creation of a potent response utilizing the medical assets, capabilities and talents of the medical community, including physicians, veterinarians and dentists here in the U.S.

As of a year ago, enthusiasm in official and professional circles was only lukewarm for a vigorous response strategy that included the development of a partnership between civilian and military medical disaster specialists. Despite the bombing of the World Trade Center in 1993, the destruction of the Murrah Building in Oklahoma in 1995, and the Olympic bombing in Atlanta in 1996, most experts were reluctant to commit their support. Writing in the May 2001 issue of *American Journal of Public Health*, Fred Henretig, MD, described the prevailing sentiment: "The low probability of a bio-terrorist attack and the high cost of establishing and maintaining readiness are among the cited concerns, along with the observation, by analogy with the nuclear holocaust scenario, that there really may not be an effective response anyway."

But Henretig, who is with the Division of Emergency Medicine at Children's Hospital of Phila-

When should you suspect bioterrorism?

If the incidence of disease does not appear to be a natural occurrence, then bio-terrorism needs to come under suspicion, according to David Franz, DVM, PhD, an internationally recognized expert in biological defense. Franz, who currently heads the Chemical and Biological Defense Division of the Southern Research Institute (SRI), says:

- Veterinarians should generally be alert and suspicious.
- Veterinarians need to be aware of unusual disease occurrences, especially if they are viral.
- Veterinarians need to update and educate themselves in zoonotic diseases and the bio-terrorist threat.
- Veterinarians need to recognize epidemiological clues; if there is a tight cluster of casualties in a particular area in a particular time frame, veterinarians should take note and report their concerns to local and regional disease control authorities.

Continued on page 5

Knowledge, compassion keys to cancer treatment

By Del Rae A. Martin, DVM

As veterinarians in companion animal practice, we need to be concerned about cancer in our patients. The prevalence of cancer in companion animals is increasing. As our clients are providing better nutrition, preventative care, medical care and have a deeper devotion to their pets, we as veterinarians are being called upon to more frequently to diagnose and manage the pet with cancer.

Veterinarians need to approach the pet with cancer in a positive, compassionate and knowledgeable manner. We owe it to our companion animal patients and their owners to be well-informed and up-to-date on current treatment methods. Owners who seek treatment for their companion animals with cancer are devoted and compassionate. When our clients present their pets with "lumps" to be examined, we need to take their concerns seriously. Rather than a wait and see approach, we need to initiate diagnostics to determine a diagnosis, treatment plan and prognosis. Important steps that may need to be taken prior to initiating treatment are hematology, serology, radiology, cytology and histopathology. A veterinary pathologist should examine virtually all masses that are removed from clients' pets.

Many of the chemotherapy drugs in use in veterinary medicine are user friendly. The oncologists at the universities are willing to assist veterinarians with the protocols. There are several good reference books available. By providing appropriate diagnostics and chemotherapy alternatives for your patients, veterinarians are extending the patients' quality



of life and preserving the bond that exists between clients and their companion animals.

The author is a private practitioner associated with Heart River Animal Hospital, Mandan.

NORTH DAKOTA ANIMAL HEALTH UPDATE welcomes articles by or suggested topics from North Dakota practitioners. Veterinarians who wish to submit articles or suggest subjects for articles should call the State Board of Animal Health at (701) 328-2655 and ask for Dr. Schuler or Dr. Keller.

West Nile Virus yet to be reported in North Dakota

The good news is that the West Nile Virus (WNV) has yet to be detected in North Dakota. The bad news is that it is moving closer.

Minnesota state health officials expect to find WNV in their state this year. It has already been detected in Iowa and Wisconsin.

The North Dakota Department of Health will soon make available a protocol for veterinarians to follow in submitting samples for testing for WNV.

The disease has spread rapidly in this country, since it was first detected in New York in 1999. It has now been reported in 20 states, and has been detected in a variety of birds and mammals, including humans.

2001 Samples and Test Results North Dakota		
Sample	June 1, 2001 to September 30, 2001	
	Tested-to-date	Positive-to-date
Human Serology	6	0
Horse Serology	7	0
Dead Birds	4	0
Mosquito Pools	4	0

Horses are particularly susceptible to WNV. Last year, there were 738 cases of clinical WNV in horses nationwide. Of these, 640 were classified as confirmed and 11 as probables.

Of the 470 horses for which an outcome

was reported, 156 (33 percent) died or were euthanized.

As of May 30, eight equine cases have been reported this year, all in Florida and Louisiana.

10 biosecurity steps to protect your operation

Here's a checklist to pass on to your clients who want to implement a successful biosecurity plan. The plan should include:

- Strict health and vaccination program.
- Awareness of diseases, how they are contracted and the risks in your area or region.
- Ability to control animal contacts.
- Ability to control all human traffic.
- Accurate assessment of health and nutrition status of your horses.
- Health, vaccination and production record history of purchased animals.
- Quarantine program and *separate* facilities for new animals.

- Isolation stall or paddock for sick animals.
- Clean, sanitary equine equipment and facilities.
- Regular veterinary inspection and consultation.

This article was adapted from the Winter 2002 issue of [EQUINE HEALTH REPORT](#), published by the National Institute for Animal Agriculture.

Veterinarians on front line against bio-warfare

Continued from page 3

delphia and on the staff of the Departments of Pediatrics and Emergency Medicine at the University of Pennsylvania School of Medicine, did not agree with the assessment: "In contrast, I believe that terrorism with chemical weapons does indeed pose a serious public health and security threat to our nation, and that with foresight and preparation it will be possible to mitigate the ensuing disaster if such an attack occurs."

Since Sept. 11, his concerns obviously materialized. The subsequent anthrax assaults underscored the seriousness of the bio-terrorist threats and begged for a policy backed up with the resources to create the infrastructure. But four months before that, Henretig was already on record as saying: "It strikes me that cooperation among a broad array of government agencies, as well as with concerned academic and professional organizations, is precisely the correct approach for addressing this potential national catastrophe."

Henretig went on to state "the potential threat of biological and chemical terrorism to national health interests mandates considerable funding." As it turns out, he can breathe a little easier now that President Bush submitted his administration's budget for fiscal 2003 early last month. The budget proposal is still a request at the moment. But odds are that there will be little debate or dissent about the record expenditures ear-

marked for protecting Americans from biological terrorism. Overall, President Bush has asked for \$ 5.9 billion to bolster the country's defensive efforts against the use of disease as a weapon by terrorists and terrorist nations. By comparison, public health and defense authorities currently can draw on only \$1.4 billion to confront bio-terrorism.

Allocation of that nearly \$6 billion bio-terrorism budget calls for \$1.6 billion to be given to states and local health-care systems; \$1.8 billion to be used to improve federal facilities (including \$650 million for vaccines); and \$2.4 billion to go into research and development toward detection and response to actual attacks. The three primary recipients of the funding are the National Institutes of Health, the Department of Defense and the Environmental Protection Agency.

In other times, the real conflict would have been waged just to get the funds to come up with a preparedness and response strategy or policy. Now that the resources are available, however, the enormous difficulty of drawing up battle lines and identifying the enemy is emerging as perhaps the greatest military challenge in the history of warfare.

"Bio-terrorism does not have a hot zone," says Ford, who stressed also that dissemination of the biological agents takes place before detection, which in military terms rules out any effective interdiction. Targets for bombs and missiles can be anticipated and advancing troops can be

spotted. But biological warfare is altogether another thing. Even when it is not an act of aggression, it is confounding. "When the West Nile disease was detected two and half years ago," recalls Ford, "it still took a year to learn it wasn't a terrorist event, but in fact a natural phenomenon."

There's a good chance that the complexion of war is changing. While some conflicts in the future may still involve the mobilization of armored and infantry divisions against opponents on a battle field, Ford remarked that the conduct of warfare could shift away from "hot lead on a target" to the utilization of "bacteria as bombs." Ford went on to comment that "if the Pentagon can't shoot it down, it gets a little uncomfortable." He was referring to the situation in which the armed forces haven't been able to handle the idea of biologicals used as weapons.

"There's a lot of creative thinking going on out there, too," said Ford of the terrorists who devise ways to deliver chemical and biological strikes. "Anybody can grow anthrax," he said, "but delivery in the form of a letter through the postal service surprised everyone." Terrorists can wield other diseases, such as Ebola virus and bubonic plague. And that is precisely why veterinarians, according to Ford, will have to play a critical role in defending the country against bio-terrorism. "These are diseases of animals transmitted to humans," he emphasizes. Veterinarians will

Continued on page 6

Texas to lose TB-free status

Texas livestock health officials are alerting cattle producers, veterinarians and livestock markets that the U.S. Department of Agriculture will strip Texas of its "Free" status for cattle tuberculosis eradication on or around June 1. The TB status downgrade will mean that the 150,000 or more breeding cattle hauled out of Texas each year must have a negative tuberculosis skin test prior to being moved. USDA has placed a moratorium on additional restrictions until at least January 2003, when the state's feeder cattle must be identified with official ear tags before being transported out of state.

The downgrade in TB status comes as a result of the diagnosis of two TB-infected cattle herds in 2001. Both infected herds were detected by slaughter plant inspectors, who found carcasses with internal lesions indicative of TB. The National Veterinary Services Laboratory confirmed TB from submitted lesion samples.

The two infected herds have been depopulated. More than 130 other herds have been tested, as state and USDA officials search for the origin of the disease outbreak, and where it may have spread. No other infected herds have been detected, and veterinary epidemiologists have been unable to pinpoint the source of infection.

Federal regulations mandate a loss of TB-free status when a state has two or more infected herds disclosed within a 48-month period. Texas will move from the TB-free status it has held since November 2000, to modified accredited advanced status, the second highest rung in an international five-tier ranking system for cattle TB eradication. It will take at least two years without an infected herd for Texas to regain its coveted TB-free status enjoyed by all other states except Michigan.

Dr. Linda Logan, Texas state veterinarian, said that cattle industry groups continue to develop plans to address federal TB requirements that will apply to Texas feeder cattle as of January 2003.

"More than 1.5 million feeder cattle leave Texas each year, and each of these animals will have to wear an official identification ear tag," she said. "Currently, official tags are used to identify animals tested for brucellosis, and these must be applied by private veterinary practitioners, or state or federal staff. The identification tags improve the ability to trace animals back to their herd of origin."

Veterinarians on front line

Continued from page 5

be relied to create awareness of the threat, detect it and assess situations in the event of an attack. Since Sept. 11, Ford reports that the sense of urgency, the spirit of resolve and cooperation, has multiplied exponentially within the public health services and the Pentagon. "We're a team," he says, "no one's saying 'I'm a physician, you're a vet.'"

In a sense, the first battle in the war against bioterrorism has been won. Most people are now in agreement that the threat deserves a full frontal assault; such an idea was previously a huge obstacle to overcome. More importantly, there is money to back up that attitude, especially

if the administration receives the \$ 5.9 billion it wants to pinpoint specifically at bio-terrorism.

Nevertheless, no matter how sophisticated the surveillance, how persistent the investigation, or how rapid and fierce the military response is, the war on bio-terrorism, as Ford sees it, is becoming "more and more of a medical battle "Veterinarians, physicians and dentists are the warriors.

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Elk contact linked to brucellosis in Idaho cattle herd

Brucellosis has been confirmed in an Idaho cattle herd, located in the Greater Yellowstone Area where brucellosis is known to exist in wild elk and bison.

The herd was tested on April 15, after being exposed to a brucellosis-affected elk herd during the winter of 2001-02. This cattle herd has been tested annually since 1998, in response to the possible annual exposure of the cattle to brucellosis-affected elk on winter feedgrounds. The first four annual tests were negative. On the April 15 test, six cows were positive and two were suspect on the blood tests.

In an effort to confirm whether or not the herd was infected with brucellosis, state and federal animal health staff collected milk samples for culture, as well as additional blood samples for serologic evaluation from the positive animals. All of the blood tests from these animals have shown positive results. Milk collected from one of the positive cows was cultured for brucellosis and has yielded *Brucella abortus* biovar 1, the same strain isolated from an elk trapped on the cattle ranch during the winter of 2001-02.

The herd will be depopulated.

Under the National Brucellosis Program standards, a state is allowed to identify one infected herd and retain its Brucellosis Class Free designation if the state meets certain criteria. The state must identify and test all cattle that may have been exposed to the affected herd to assure that the disease has not spread to other cattle herds; identify all cattle that potentially could have introduced the disease into the affected herd; ensure all tests of exposed and potential source herds are negative; ensure the tracing and testing is accomplished within 60 days; and ensure the herd is depopulated within the same 60-day time period.

This article was derived from a press release issued by the Idaho Department of Agriculture.

BRD: Feedlot industry's No. 1 enemy

Commonly referred to as shipping fever, bovine respiratory disease (BRD), is the leading cause of illness and death in U.S. feedlots. Estimates are that BRD costs producers in excess of \$1 billion annually in animal deaths, reduced weight gain, lower feed efficiency, antibiotic needs, carcass trimming at the packing plant, and poor quality meat and hide products.

The BRD disease complex results from an interaction of stress, immunity and infectious pathogens. Ultimately, bacteria (usually *Mannhiemia hemolytica* or *Pasteurella multocida*) invade the lower respiratory system leading to bronchopneumonia, which manifests itself clinically as BRD.

USDA's National Animal Health Monitoring System (NAHMS) released a study last fall on the treatment of respiratory disease in U.S. feedlots that revealed the serious toll taken by BRD.

NAHMS reported that 97.6 percent of feedlots had at least one animal develop BRD during its 1999 study year with 12 top cattle feeding states. Overall, 14.4 percent of all placements developed BRD while at feedlots, nearly five times more than the next most reported disease, acute interstitial pneumonia.

NAHMS reported that 99.8 percent of feedlots included an injectable antibiotic as part of the therapeutic regimen for BRD. Common antimicrobials used for initial treatment of respiratory disease were tilmicosin, florfenicol and tetracyclines. Researchers at the USDA Agricultural Research Service (ARS) have been working on a remedy for BRD since 1993. In January they reported a breakthrough with a new oral vaccine for shipping fever in cattle. It may be on the market in about three years. Dr. Robert Briggs and Dr. Fred Tatum of the National Animal Disease Center (NADC) in Ames, IA, developed the

oral vaccine, which is a modified live preparation, through genetic engineering.

"We went in and removed specific genes that allowed the BRD causing organism to cause bronchopneumonia in cattle," said Briggs. "The organism can't cause pneumonia anymore, but is able to colonize the mucosal surfaces in the respiratory tract where the bacteria normally reside. It elicits a mucosal as well as systemic immunity, which is more natural."

In an ARS field trial, the oral vaccine was fed to calves considered to have either high or low risk for BRD. Vaccinated and unvaccinated high-risk calves were shipped from Arkansas to a New Mexico State University feedlot. Low-risk animals were shipped to the same feedlot, but from a much shorter distance.

"The trial results have been fruitful," said Briggs. Only 4 percent of vaccinated high-risk calves died, compared to 16 percent of unvaccinated ones. Low-risk calves given oral vaccine had a 25 percent higher average weight gain than untreated ones during the first 28 days on feed.

Another positive is that the oral dose protects the animals within 34 days, instead of the 7-10 days common with injectable vaccines, reported Briggs. Administering the vaccine orally instead of in the muscle also produces fewer lesions.

The Biotechnology Research & Development Consortium, Peoria, IL., funded part of the research and has applied for a patent.

This article was originally published in the Winter 2002 issue of CATTLE HEALTH REPORT, published by the National Institute for Animal Agriculture.

Feds propose CWD/elk plan

Continued from page 2

positive, or exposed herd, including whole herd depopulation, quarantine, reproductive control, selective culling, continued surveillance and fencing. Herd plans must outline cleaning and disinfection procedures for facilities and further use of the land due to possible environmental contamination from a CWD positive herd.

Herd depopulation is the preferred option of a herd plan in the event of a positive diagnosis because of CWD's long incubation period, absence of a live animal, pre-clinical test and current state of knowledge on transmission. Whole herd depopu-

lation with no restocking on contaminated premises presents the least risk of further spread of the disease once a positive diagnosis has been made. Other approaches may be necessary where depopulation is not possible, undesirable or impractical. These may reflect limitations on indemnity funding, the desire to increase surveillance and monitoring, and the need for flexibility in order to encourage initial participation and reporting on the part of owners.

The federal government would provide indemnity for depopulation. This could be supplemented by payments from states and industry.

States take action

More than a dozen states have banned or restricted the importation of elk, deer or other cervids in an effort to halt the spread of chronic wasting disease (CWD). These states (as of June 1, 2001) include: Arizona, Arkansas, Colorado, Florida, Iowa, Illinois, Indiana, Louisiana, Massachusetts, Michigan, Minnesota, Missouri, New Hampshire, New York, Tennessee, Texas, Vermont and Wisconsin.

State restrictions range from limitation on import to outright ban of all transport of domestic cervids.

FDA bans extralabel nitrofurans use

The U.S. Food and Drug Administration now prohibits extralabel use of topical nitrofurans animal and human drugs in food-producing animals. FDA cited evidence indicating that extralabel use of topical nitrofurans drugs in food-producing animals may result in the presence of residues that are carcinogenic and have not been shown to be safe.

The following drugs (both animal and human), families of drugs, and substances are prohibited for extra-label uses in all food-producing animals:

- Chloramphenicol
- Clenbuterol
- Diethylstilbestrol (DES)
- Dimetridazole
- Ipronidazole
- Other nitroimidazoles
- Furazolidone, Nitrofurazone, other nitrofurans
- Sulfonamide drugs in lactating dairy cattle (except approved use of sulfadimethoxine, sulfabromomethazine, and sulfaethoxy-pyridazine)
- Fluoroquinolones
- Glycopeptides.

In the past, FDA permitted two approved topical nitrofurans to be used in cattle. These products were:

1. Furazolidone aerosol powder (trade names such as Topazone and Furox aerosol.)
2. Nitrofurazone topical powder for pinkeye and wounds (trade names such as NFZ Puffer and P.E. 7.)

A carbon-14 radio-label residue depletion study conducted by the FDA showed that detectable levels of nitrofurans derivatives are present in edible tissues (milk, meat, kidney, liver) of cattle treated by the ocular route. The study indicates that use of these nitrofurans products may pose a risk to public health because residues of known carcinogens are present in edible tissues.

Additional information on the prohibition is contained in the Feb. 6, 2002, Federal Register (<http://www.fda.gov/OHRMS/DOCKETS/98fr/020602b.htm>). Questions about this prohibition may be directed to: Gloria J. Dunnava, Center for Veterinary Medicine (HFV-230), Food and Drug Administration, 7500 Standish Place, Rockville, MD 20855, 301-827-1168, e-mail: gdunnava@cvm.fda.gov. Please note that the address and telephone number for Dunnava in the February 6, 2002, Federal Register is incorrect.

