

# VETERINARY

## FOR THE PRACTICING VETERINARIAN

# Quarterly

Fall 2012  
Volume 15, Number 2

## New Fact Sheet: Blue-Green Algae in Farm Ponds

Kansas practitioners may have been asked about blue-green algae, especially over the past two summers in drought-stricken areas. A new K-State Research and Extension fact sheet, *Identification and Management of Blue-Green Algae in Farm Ponds*, MF3065, co-authored by Deon van Der Merwe, veterinary toxicologist, Carol Blocksome, agronomist, and Larry Hollis, beef veterinarian, is available at [www.ksre.ksu.edu/library/h20ql2/mf3065.pdf](http://www.ksre.ksu.edu/library/h20ql2/mf3065.pdf).

The fact sheet offers practical information about the organisms involved, their toxins, sampling to test for the organism, and management options to reduce disease or death of cattle, pets, and wildlife as a result of ingesting the harmful bacteria.



*Blue-green algae rapidly reproduce and may form blooms, or large colonies, that are visible as a scum on the water's surface.*

## Convenient Tests, Treatment for Cattle Nitrate Toxicity

Larry C. Hollis, D.V.M., M.Ag.  
Extension Beef Veterinarian

Widespread drought affecting Kansas forage and grain crops this year has dramatically increased the potential for nitrate toxicity. Many producers have already lost cattle grazed on failed standing corn. To avoid future losses, they should be reminded to test forages or crop residues before grazing or baling for hay as existing nitrate levels will remain. Recommend testing weedy species, such as pigweed or kochia, that accumulate nitrates and contaminate grazed or baled forages when present in large quantities.

For evidence of nitrate toxicity during necropsy, look for chocolate-brown blood in the subcutaneous tissues. Often this is easier to observe by viewing tissues from a distance. Ocular fluid is a convenient diagnostic sample to collect. Nitrate levels in ocular fluid will be elevated if nitrate toxicity is the cause of death. Fetuses aborted as a result of anoxia caused by nitrate toxicity often will not show characteristic signs or lesions. Aborted fetuses will usually be observed 24 to 48 hours after the sub-toxic lethal event occurs in pregnant females.

The diphenylamine spot test is a quick test for detecting the presence or absence of nitrate in forage stems. Specifics about the test, which can be completed in the field or veterinary clinic, are provided here by Dr. Dee Griffin of the Great Plains Veterinary Educational Center in Clay Center, Neb.

## Diphenylamine Nitrate Detection Test

This is a qualitative test to evaluate forages (hay, pasture, silage) for nitrate levels that are potentially dangerous to ruminants.

Prepare the test solution by mixing 0.5 grams diphenylamine with 20 milliliters of distilled water, then bringing the total to 100 milliliters with concentrated sulfuric acid. Caution: The solution contains a strong acid. Avoid contact with skin, eyes, and clothing. Store in a cool dark place. Do not add water or any other material to the solution.

1. Carefully place a drop of the solution at various locations on the inner tissue of the plant stem; repeat for several stems in each sample.

*continued on page 2*

### *In this Issue*

The drought — along with the water shortage, feed shortage, and secondary toxicity situations resulting from it — have been on the minds of livestock producers. Three articles in this issue of *Kansas Veterinary Quarterly* deal with conditions that have resulted directly or indirectly from the drought and have the potential to carry over into the fall and beyond.

*NITRATE TOXICITY* from page 2

2. If an intense blue color appears in a few seconds, the forage contains potentially dangerous levels of nitrate.
3. If the results are positive (blue color), send the forage to a laboratory for quantitative analysis before feeding.
4. Occasionally, false positive reactions occur. However, any sample resulting in a positive reaction should be tested in the laboratory.
5. Avoid contaminating the solution in the bottle with plant tissue or other material. Discard any solution that is not clear.

## Interpreting the Test

The moisture content of material to be tested markedly affects the interpretation. Wet silage may show less blueness than dryer silage but still have equal nitrate content.

A single drop of this acid reagent is placed on a freshly split plant stem. If a dark blue color develops immediately (within the first 5 seconds), nitrate is present. If there is no immediate change in color there is no nitrate; however, a dark color (brown/black) will eventually develop if the reagent remains on the plant tissue for an extended time due to the caramelizing of the plant sugars and carbohydrates by the acid.

The diphenylamine field test indicates only the presence or absence of nitrate. It does not determine the actual nitrate concentration and, as with any field test method, it should be used only as a screening tool. Any positive result from the spot test should be followed up with a laboratory analysis for quantification. A field test can help you quickly estimate what stem height is safe for grazing. Most field test methods work only on moist plants with stems thick enough to split and apply the test reagent.

### Silage

For silages, sort out several stems or pieces of pith for testing because nitrate content is higher in the stem or stalk at time of harvest. Drop reagent on the material and observe.

If the silage is moist enough, express a few drops on a spot plate to test. A light

blue color indicates some nitrate present. A rapidly developing dark blue color that appears nearly black indicates the silage should be analyzed quantitatively for nitrate. To further test, take the leafy portion of the silage and express a drop of liquid from it. Add reagent. If it rapidly develops a dark blue-black color, feed the silage cautiously until a quantitative test is made.



*The stalk on the left shows a positive diphenylamine nitrate test. The stalk on the right represents a negative nitrate test. This test is qualitative only. To determine actual nitrate levels stalks must be sent to a lab.*

### Green chop

For green chop, a few drops of liquid usually can be expressed and tested. Rapidly developing dark blue and black color indicates a level of nitrate that requires a quantitative analysis. For corn that has a small to large normal ear, split the stalk and test by nodes. If only a weak test is observed above the ear node, there will be a dilution of at least half of the nitrate in the base nodes when chopped. No problems should be anticipated in direct feeding or ensiling.

As long as the crop is green and has not been severely drought damaged (whitish-green to gray leaves), normal ensiling will further reduce the nitrate. Some reduction of nitrate will occur between the time of cutting and feeding. Overnight storage on wagons is not recommended because nitrite could build up. Chop and feed as needed. One exception is where cyanide (prussic acid) is a problem in some sorghums, overnight storage on wagons or trucks would result in loss of cyanide.

### Dried fodders and hays

Test stems and stalks. If dark blue-black color rapidly develops, check the leaves. If leaves are also very positive,

make a quantitative analysis before feeding the forage or feed it cautiously. Dried plants, hay, silage, fine-stemmed grasses and similar material should be tested in a laboratory.

In laboratory reports nitrate content may be expressed as actual nitrate (%  $\text{NO}_3$ ) or nitrate-N (%  $\text{NO}_3\text{-N}$ ) values. The industry standard is to report forage nitrates as percent nitrate, which differs from plant nitrate analysis. Plant nitrates are expressed as ppm nitrate-N. To convert nitrate-N levels to actual nitrate, multiply by 4.42. Some labs may report in parts per million (ppm). To convert ppm to percent, divide by 10,000. Understand the reporting method of the laboratory you use to prevent confusion that could cause you to feed a toxic nitrate level to livestock.

Because methylene blue, the standard product used to treat nitrate toxicity, is not readily available from traditional pharmaceutical manufacturers or distributors, practitioners in nitrate toxicity-prone areas may have to compound the drug or have the drug made for them by a compounding pharmacy. Special guidelines exist that must be considered in both the compounding and therapeutic use of methylene blue in cattle. Dr. Griffin also provided the following information:

## Methylene Blue as an Antidote

Methylene blue can be used as an antidote for methemoglobinemia resulting from nitrate toxicosis in ruminants if the Compliance Policy Guidelines (CPG) Sec. 608.400, *Compounding of Drugs for Use in Animals*, is followed. FDA announced the guidelines on July 3, 1996 (61 FR 34849), to advise FDA's field and headquarters staff on the compounding of animal drugs by veterinarians and pharmacists for use in animals. The purpose of this document is to review the requirements for use of methylene blue, where to obtain methylene blue, and how to treat an animal with nitrate toxicosis.

NOTE: Methylene blue is a bulk drug substance used for compounding and subsequent treatment of animals to which the FDA-CVM would not ordinarily object.

## FDA-CVM Requirements for Use of Methylene Blue

1. Drug must be used only by or under the supervision of a veterinarian.
2. Valid vet/client/patient relationship must exist.
3. Drug must be used for therapeutic and not production purposes.
4. Drug must not produce violative food residues. Use of methylene blue requires a 180-day withdrawal period.
5. Records must be kept for at least two years, containing the following information:
  - A. ID of animals treated, either individually or as a group.
  - B. Species, number of animals and condition being treated.

C. Established name for drug and active ingredient.

D. Dosage prescribed or used: see treatment protocol below.

E. Duration of treatment.

F. Specified withdrawal time for meat, milk, eggs or animal-derived food: Use of methylene blue requires a 180-day withdrawal time.

It is imperative that any veterinarian who uses methylene blue to treat methemoglobinemia inform the client about the 180-day withdrawal period. Staff at Center for Veterinary Medicine, Food, and Drug Administration are serious about enforcement of the withdrawal period if methylene blue is used. It is considered a possible carcinogen in humans, so residues in food for humans obtained from methylene blue-treated animals are of concern.

Methylene blue can be purchased from Fisher Scientific in 100-gram quantities. To prepare a 1% solution, weigh 1,000 milligrams (1 gram) and add to 100 milliliters of isotonic saline or distilled water. A 1,000-pound animal treated at 1 milligram per kilogram would need 46 milliliters IV. Contact number is 800-766-7000. Product catalog #BP117-100.

Centaur, Inc. has a ready-to-use 1% methylene blue solution that can be used to treat nitrate toxicosis. It is available in 500 milliliter and 4,000-milliliter sizes from Centaur Inc. in Overland Park, Kan. Contact number is 913-390-5907.

Methylene blue treatment protocol for cattle:

Reference: Kahn, C.M. (Editor) (2010) The Merck Veterinary Manual, 10th Edition, Merck and Co., Inc., Whitehouse Station, NJ: 2091-2094.

**Treatment:** Slow IV injection of 1% methylene blue in distilled water or isotonic saline should be given at 1-22 mg/kg body weight, or more, depending on severity of exposure. Lower dosages may be repeated in 20-30 min if the initial response is not satisfactory. If additional exposure or absorption occurs during therapy, retreating with methylene blue every 6 to 8 hours should be considered. Rumen lavage with cold water and antibiotics may stop the continuing microbial production of nitrite.

Volume of 1% methylene blue solution required to treat animals of various body weights and dosages

Body weight		Volume of 1% methylene blue solution (mL) for dosages of:						
Pounds	Kilograms	1 mg/kg	4 mg/kg	8 mg/kg	12 mg/kg	16 mg/kg	20 mg/kg	22 mg/kg
500	227	23	91	182	273	364	455	500
750	341	34	136	273	409	545	682	750
1000	455	46	182	364	545	727	909	1000
1250	568	57	227	455	682	909	1136	1250

# Prompt Diagnosis, Reporting Urged in Suspected Cases of Vesicular Stomatitis, Other Vesicular Diseases

*Jerome C. Nietfeld, D.V.M., P.h.D.  
Veterinary Diagnostic Laboratory*

Vesicular stomatitis (VS) is an insect transmitted viral disease that causes vesicles and blister-like lesions in and around the mouth, nostrils, feet, prepuce, vulva, and teats. The disease most often affects horses and cattle, but pigs, sheep, goats, llamas, and alpacas are also occasionally affected. Rarely, humans develop clinical disease. The lesions are indistinguishable from those of foot and mouth disease (FMD) and other vesicular diseases. For that reason, vesicular stomatitis is an internationally reportable disease and prompt and accurate diagnosis is important. Veterinarians and livestock owners that suspect VS or any other vesicular disease should immediately contact the state or federal animal health authorities. Diagnosis must be confirmed by the U.S. Department of Agriculture's National Veterinary Service Laboratories in Ames, Iowa. Until the disease has been confirmed or ruled out, animals suspected of having VS should not be moved from the premise.

## Etiology

Vesicular stomatitis is caused by vesicular stomatitis virus (VSV) which is a member of the genus *Vesiculovirus* in the family *Rhabdoviridae*. It is an envelope, single-stranded, negative sense, bullet-shaped RNA virus. There are four serotypes: Indiana 1, 2, and 3, and New Jersey. Vesicular stomatitis virus is endemic to parts of North, Central, and South America. In the past several decades outbreak in the United States have occurred in the southwestern and western states.

## Host Range

Horses, donkeys, mules, cattle, and pigs are most severely affected. Llamas and alpacas are also susceptible. Sheep and goats are resistant and clinical disease is rare. Death due to VS is rare, but horses that develop laminitis are

sometimes euthanized. Rarely, humans are clinically affected with the disease characterized by fever, headache, muscle aches and vesicles in the oral cavity. Recovery is usually after 4 to 7 days.

## Epidemiology

The virus appears to be stable in endemic areas. Research indicates that viral strains originate in endemic areas in southern Mexico. Factors responsible for spread to the United States are unknown. Methods of transmission include insect vectors, direct contact between infected animals, and fomites. The virus can be transmitted by biting insects, and sand flies, blackflies, biting midges, and *Culicoides* species are believed to play a role in transmission. VSV is present in vesicles and surfaces where vesicles have ruptured. Direct contact is an important means of spread during an outbreak. Virus is not present in urine, feces, or milk. Serologic studies have shown that in endemic areas nearly 100% of dairy cattle are serologically positive and in some non-endemic areas of the U.S. many clinically normal animals are positive. Thus, subclinical infection is common.

## Clinical signs

Fever is inconsistent. Vesicles can develop in the mouth on the gums, lips, and tongue, and on the snout, coronary bands, and teats. Excessive salivation, lameness, and pain during milking are common. Cattle with teat lesions often develop mastitis. Lesions on the coronary band of horses and cattle can lead to laminitis and occasionally hoof loss. It is not uncommon for pigs to lose a claw. Because of the oral lesions affected animals have difficulty eating, and weight loss is common.

## Gross Lesions

Pale, blanched areas that progress to vesicles that quickly ulcerate are the hallmark lesion and are identical to those seen with other vesicular diseases. The

vesicles and ulcers are most common on the lips, muzzle, and tongue of all species. In cattle they are especially common on teats and the interdigital spaces of the feet. In swine lesions are most likely to be on the snout, coronary bands, and interdigital spaces.

## Diagnosis

Vesicles and ulcers in and around the mouth, feet and teats should raise suspicion of a vesicular disease, which includes foot and mouth disease, vesicular stomatitis, and swine vesicular disease. Vesicular stomatitis is the only vesicular disease that affects horses. Foot and mouth disease affects only cloven-footed animals, and swine vesicular disease affects only swine. Vesicular exanthema of swine was limited to the U. S. and has not been reported for over a half-century, consequently it is no longer included in the list of internationally reportable diseases.

Vesicular fluid and epithelium from ruptured vesicles have large amounts of virus and are good specimens for diagnosis. Swabs of lesions are also suitable. Serum can be tested for the presence of IgM and should also be collected. The most important thing to do if a vesicular disease or any other foreign animal disease is suspected is to immediately contact the proper state and/or federal animal health regulatory health people and not move livestock from or onto affected premises until cleared to do so.

## Prevention

Prevention is largely insect control and biosecurity, which is often very difficult for animals at pasture. During an outbreak, keeping animals out of pastures where transmission is known to have occurred, keeping animals indoors, and fly control are often advocated. Animals on affected farms are often quarantined and animal movements in affected areas are often restricted to help prevent spread of the virus. Vaccines have been developed, but are not widely used.

## Additional Reading

*Vesicular Stomatitis.* USDA APHIS Fact Sheet, May 20112, available at: [http://www.aphis.usda.gov/publications/animal\\_health/content/printable\\_version/fs\\_vesicular\\_stomatitis\\_2012.pdf](http://www.aphis.usda.gov/publications/animal_health/content/printable_version/fs_vesicular_stomatitis_2012.pdf)

*Vesicular Stomatitis.* In: Foreign Animal Diseases, Committee on Foreign and Emerging of the United States Animal Health Association, 7th edition, revised 2008, pages 423-429.

The book Foreign Animal Diseases is published by the United States Animal Health Association and is an excellent source of information on foreign animal diseases. It contains many color photographs of gross lesions. It is available free on line at: [http://www.aphis.usda.gov/emergency\\_response/downloads/nahems/fad.pdf](http://www.aphis.usda.gov/emergency_response/downloads/nahems/fad.pdf)



*Horse mouth showing extensive erosion of the lip at the mucocutaneous junction.*

Center for Food Security and Public Health

## VSV confirmed in New Mexico

On April 30, 2012, the National Veterinary Service Laboratories (NVSL) in Ames, Iowa confirmed vesicular stomatitis virus (VSV) (New Jersey serotype) infection in a horse from Otero County, New Mexico. This was the index case of vesicular stomatitis for the United States in 2012. As of July 31, 33 horses on 24 premises in 7 counties in New Mexico have been identified as VSV positive. All VSV cases have been the New Jersey serotype and only horses have been affected. According to the USDA Situation Report of July 31 there have been a total of 225 susceptible equine on the affected farms.

As of July 31, 4 premises have been released from quarantine and 15 premises are on countdown for quarantine release. Premises are eligible to be released from quarantine 21 days after the lesions have healed in all affected animal. The New Mexico Livestock Board has a website with photographs of equine lesions, clinical signs, and tips to protect animals from infection that is available at: <http://www.nmlbonline.com/documents/Protect%20Your%20Horses.pdf>

## Foot and Mouth Disease Vaccine

The following information is from a news release from the U.S. Department of Homeland Security. Full text is available at: <http://www.dhs.gov/files/programs/st-animal-disease.shtm>

The Departments of Homeland Security (DHS) and Agriculture announced the development of a novel vaccine against one of the world's most devastating animal diseases foot and mouth disease (FMD). FMD virus is extremely contagious and fast spreading, affects cloven footed animals such as cattle, sheep, goats, pigs, and deer and causes fever, blisters on the feet and mouth, loss of appetite, drooling, and lameness. Most affected herds are culled, as in the 2001 outbreak in Great Britain when over 10 million animals were destroyed.

Traditional FMD vaccines have three problems. First, there are seven serotypes and more than 60 subtypes of FMD and vaccines must be matched to the infecting virus to be effective. Second, the vaccines contain live FMD virus so they cannot be produced in the United States, and; third, it is usually not possible to differentiate vaccinated from infected animals. This means that vaccinated animals cannot enter areas that are free of FMD. The new vaccine

which was developed at the Plum Island Animal Disease Center (PIADC) does not use a live FMD virus and it can be used to differentiate infected from vaccinated animals. The vaccine includes the FMD viral capsid, or outer protein coat, and does not include the nucleic acid genome. The empty viral capsids trigger a protective immune response in vaccinated animals. According to Dr. Marvin Grubman of the USDA Agricultural Research Service at PIADC, "The absence of the nucleic acids of the real virus allows us to differentiate between vaccinated and infected animals. This is critical when determining that an animal is free of infection after an FMD outbreak. Now it will no longer be necessary to destroy all the animals in a herd when just a few become infected." The vaccine is said to be the biggest news in FMD research in 50 years. A conditional license to manufacture and distribute the vaccine, should the need arise, has been granted to Antelope Valley Bios, Inc. who manufacture the vaccine under a contract from GenVec. The new vaccine protects against only one strain of the virus, but the DHS has several additional vaccines ready to enter the licensing process.

# A Case of Plant Poisoning in Beef Calves

Jerome C. Nietfeld, D.V.M., P.h.D.  
K-State Veterinary Diagnostic Laboratory

In June a private practitioner called the Kansas State Veterinary Diagnostic Laboratory (KSVDL) about a Kansas beef producer who had reported multiple sudden deaths in a group of suckling fall-born calves.

Initial calf tissue samples examined by KSVDL pathologist, Kelli Almes, revealed the calves had hepatic lipidosis (fatty liver) suggesting they were not sudden death cases. A field investigation was initiated by KSVDL staff and the private practitioner.

The investigation revealed the cow-herd was in excellent body condition, and the calves were growthy. All cows and calves appeared healthy. The pasture had been experiencing drought conditions for two years. The veterinarians walked the pasture and discovered little grass available for grazing, with evidence of cows and/or calves grazing multiple weed types.



Michael Haddock

*Senecio plattensis*

The weeds were collected and brought back to the KSVDL. One weed, *Senecio spartioides*, was identified by toxicologist van der Merwe as a toxic plant. A subsequent set of tissues from a dead calf, examined by KSVDL pathologist Brad DeBey, revealed hepatic lesions suggestive of *Senecio* sp. consumption.

The producer was advised to move the cattle elsewhere, but he elected to supplement grazing with sorghum sudan hay. Since supplementation (three weeks ago), no further health issues have occurred.

Several lessons were learned from this case:

- Cattle can perform well (maintain body condition and milk) when grass is limited but certain weeds are abundant.
- Some *Senecio* sp. contain pyrrolizidine alkaloids that are bitter and normally make the plant unpalatable, but in areas of poor grass growth, cattle will consume this plant.
- It may be possible to provide feed supplementation to reduce the likelihood of cattle consuming toxic plants.
- The value of a private practitioner's involvement in herd health issues cannot be overstated, and multiple diagnostic submissions can increase the probability of a diagnosis.

Photo credit: Michael Haddock, Kansas Wildflowers and Grasses, <http://www.kswildflower.org/>

# Colorado State Veterinarians Recommend Equine Vaccines for Alpacas to Thwart West Nile Virus

(The full text is available at: <http://www.news.colostate.edu/Release/6334>)

Colorado State University veterinarians recommend use of equine West Nile virus vaccines to help prevent West Nile virus disease in alpacas. Llamas seem to be relatively resistant to developing severe disease, West Nile virus infection in alpacas sometimes results in life-threatening encephalitis. It is estimated that approximately 10% of the alpacas showing neurologic signs can die from the disease. Clinical signs in alpacas include lethargy, anorexia, weakness, muscle tremors, head and neck tremors, stumbling, incoordination, and in severe cases, paralysis.

According to Dr. Rob Callan the head of Colorado State's livestock veterinary service at the Veterinary Teaching Hospital, transmission of West Nile virus varies from year to year and depends on a number of factors, including numbers of mosquitoes. The hot dry weather across the country this year has created ideal conditions for the types of mosquitoes that transmit West Nile virus. Consequently, they are seeing increased numbers of West Nile virus in Colorado livestock. Four cases have been diagnosed this summer in horses.

West Nile virus is carried by infected birds and is spread locally by mosquitoes that feed on infected birds. Bites from infected mosquitoes then transmit the

virus to humans and animals. There are no West Nile virus vaccines licensed for use in llamas or alpacas, but equine vaccines can provide protection that may prevent the disease or decrease severity in these animals.

"Based on the dramatic decrease in clinical cases in alpacas since West Nile virus was introduced in the area, it appears that following initial vaccination and booster, alpacas will retain enough protection to minimize the development of neurologic disease and be re-immunized by natural infection in following years," Callan said. "Vaccination in llamas is considered optional since disease in llamas is so rare."

# Epizootic Hemorrhagic Disease Virus in Cattle

Jerome C. Nietfeld, D.V.M., P.h.D.  
K-State Veterinary Diagnostic Laboratory

Epizootic hemorrhagic disease (EHD) virus is the most important disease of white-tailed deer in the United States. It is closely related to bluetongue virus (BT) and is transmitted by biting midges in the genus *Culicoides*. This has been an active year for EHD with large numbers of dead deer reported across the eastern third of Kansas as well as in many other midwestern and mideastern states. The Winter 2012 issue of the *Kansas Veterinary Quarterly* carried an excellent article on epizootic hemorrhagic disease in deer by Dr. Mark Ruder, then of the Southeastern Cooperative Wildlife Disease Study in Athens, Georgia and currently at the Arthropod-Borne Animal Disease Unit (ABADRU)

of the United States Department of Agriculture in Manhattan, Kansas. That article is available at: [http://www.vet.k-state.edu/features/VetQuarterly/KVQ\\_Winter\\_2012.pdf](http://www.vet.k-state.edu/features/VetQuarterly/KVQ_Winter_2012.pdf)

EHD virus also infects domestic ruminants resulting in viremia, but usually not clinical disease. Sheep are generally considered resistant to clinical disease. For many years it has been recognized that a small percentage of cattle develop clinical disease and EHD virus can be recovered from them. Clinical signs are similar to those in deer, except that it is rare for cattle to die. This summer there have been reports of clinical EHD in cattle from at least Nebraska, South Dakota and southeastern Ohio. Recently KSVDL received samples from a calf born in the spring of 2012 with a history of weight loss, drooling, sore feet,

and oral ulcers, all of which are consistent with EHD virus infection. An EDTA blood sample from the calf was PCR positive for EHD virus, which confirms that the calf was actively infected and viremic. It is important to confirm the presence of virus at the time of illness by PCR or virus isolation and not to simply run the ELISA test for antibodies. In endemic areas a high percentage of cattle are ELISA positive, often because of infection last year. If you suspect EHD or bluetongue, the sample of choice from living animals is whole blood, either EDTA or heparin, because the virus adheres tightly to erythrocytes. The specimen of choice from dead animals is spleen, although other tissues are suitable because they contain blood.

# Outbreak of Highly Pathogenic Avian Influenza in Chickens in Mexico

As of August 1, 2012, 10.5 million birds in the western Mexican state of Jalisco, which is Mexico's largest egg producing state, are at risk of contracting avian influenza and 6 million other birds have been destroyed in an attempt to stop the spread of highly pathogenic H7N3 avian influenza virus. The outbreak began at three large commercial farms on June 13 causing clinical signs in layer chickens that consisted of gasping, lethargy, fever, and death. Of more than 1 million susceptible birds greater than 500,000 became ill and over 200,000 died. Initial tests suggested a low pathogenic H7 subtype but the intravenous inoculation test confirmed that the isolate is highly pathogenic and the virus was identified as a H7N3 subtype. By August 1, 376 farms in Jalisco had been tested and the virus was detected at just

41 farms. A total of 299 farms in 15 other states were also inspected and the H7N3 virus was not detected. Infected farms and farms classified as being at risk are under quarantine and a vaccination program has begun. So far 30 million birds on 133 poultry farms have been vaccinated and another 80 million birds are expected to be vaccinated in the next few weeks. The results of the immunization campaign will be reviewed in mid-August before the second round of vaccination begins. The second round is necessary to ensure that the virus is wiped out in the region.

The last outbreak of highly pathogenic avian influenza in Mexico was in 1994-95 and involved a H5N2 strain. There is some concern by US poultry experts that parts of Mexico have large populations of backyard poultry, live

poultry markets, and commercial farms existing without adequate separation. According to the US Department of Agriculture, poultry imported from all countries except Canada must be quarantined for at least 30 days at an USDA Animal Import Center and be accompanied by import permits and veterinary health certificates. Canadian poultry entering the US must be accompanied by a veterinary health certificate issued within 30 days of importation.

The full texts from which this information was taken are available at: <http://www.cidrap.umn.edu/cidrap/content/influenza/avianflu/news/jun2612mexico.html> and <http://latino.foxnews.com/latino/health/2012/08/01/105-mn-birds-face-flu-threat-in-mexico/>

## Veterinary Continuing Education

**November 10**

KVMA Fall Conference  
Manhattan  
Contact Gary Reser at KVMA

**November 17**

Inaugural Kansas Horse Council  
Equine Clinic: Horse Care 101  
[www.k-state.edu/vet/khc12](http://www.k-state.edu/vet/khc12)

**November 29-30**

International PRRS Symposium  
and National Swine Improvement  
Federation Conference  
Marriott Downtown Kansas City  
[www.prrssymposium.org](http://www.prrssymposium.org)

**December 7**

6th Annual Conference for Care of  
Llamas and Alpacas  
Manhattan

**January 11, 2013**

Conference on Reproduction, Calving  
and Calf Care in Cow-Calf Herds  
Manhattan

**February 9**

2nd Annual Conference on Animal  
Diagnostics and Field Applications:  
Food Animal Medicine  
Manhattan

Unless otherwise noted, all classes will take place at Kansas State University College of Veterinary Medicine, Manhattan, Kan. For the most complete, up-to-date conference information visit our website at: [www.vet.ksu.edu](http://www.vet.ksu.edu) and click on Continuing Education, or contact: Megan Kilgore at 785-532-4528 or [meganlk@vet.ksu.edu](mailto:meganlk@vet.ksu.edu)

## Upcoming Events

**Oct. 3-5**

Developing and Implementing Your  
Company's HACCP Plan  
K-State Olathe

**November 15**

KSU Swine Day  
Alumni Center – Manhattan

**Jan. 8, 2013**

Winter Ranch Management Seminar –  
Weber Hall – Manhattan; also videocast  
to multiple locations across the state

**March 1, 2013**

Cattlemen's Day  
Weber Hall – Manhattan



**Newsletter Coordinators**

*Larry C. Hollis*

Larry C. Hollis, Extension Beef Veterinarian  
785-532-1246 • [lhollis@oznet.ksu.edu](mailto:lhollis@oznet.ksu.edu)

*Jerome C. Nietfeld*

Jerome C. Nietfeld  
785-532-4460 • [nietfeld@vet.ksu.edu](mailto:nietfeld@vet.ksu.edu)

**Contributors — K-State Research and Extension**

Dale Blasi	Bob Goodband	Jim Nelssen
Scott Beyer	Bob Weaver	Chris Reinhardt
Mike Brouk	Sandy Johnson	Mike Tokach
Joel DeRouchey	Brian Faris	Justin Waggoner

**Contributors — Veterinary Diagnostic Laboratory**

G.A. Andrews	M.M. Chengappa	B. DeBey
S.S. Drits	M.W. Dryden	W. Fortney
R. Ganta	R. Hesse	D.A. Mosier
T. G. Nagaraja	F.W. Oehme	P. Payne
J.A. Pickrell	S. Stockham	D. vander Merwe
M. Wight-Carter	Kelli Almes	M.J. Wilkerson
Gregg Hanzlicek	Jaymelynn Farney	Brian Lubbers

**K-State Research and Extension**

137 Call Hall  
Manhattan, KS 66506

K-State Research and Extension is an equal opportunity provider and employer. Issued in furtherance of Cooperative Extension Work, Acts of May 8 and June 30, 1914, as amended. Kansas State University, County Extension Councils, Extension Districts, and United States Department of Agriculture Cooperating, Gary Pierzynski, Interim Director.

The Kansas State University Diagnostic Laboratory and Department of Animal Sciences and Industry at Kansas State University greatly appreciates the sponsor(s) of the Kansas Veterinary Quarterly Newsletter. These sponsorships in no way imply the Departments' endorsement of the products and services offered by the sponsors. The Departments welcome inquiries from other individuals, associations and firms that may be interested in cosponsoring this publication.