

Small Ruminant Special Edition

CAHFS

CONNECTION

March 2012

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HOLIDAY SCHEDULE

CAHFS will be open, but will have limited services available on **Friday, March 30, 2012** in observance of Cesar Chavez Day.

Please contact the laboratory to plan your testing needs accordingly.

Trace mineral conditions

Trace minerals are essential to the overall health and the reproductive success of livestock. Copper (Cu) and selenium (Se) are two important trace minerals which can produce health problems due to deficiencies or toxicities. California soil and vegetation may have very low or very high concentrations of these minerals in different geographic regions. Testing for mineral levels at CAHFS can be performed on whole blood for Se (lavender top tube); serum for Cu (red top tube or royal blue top tube); and a liver biopsy antemortem or fresh liver postmortem for both Se and Cu. A minimum of 0.5ml of whole blood, 0.5 ml of serum, and 100-200 mg of liver tissue (biopsy) or 500 mg of liver tissue (necropsy) are needed for testing. Feed samples can also be evaluated for mineral content.

Copper is required for growth and maturation, neural development, and reproductive performance in all livestock. Signs of Cu deficiency include ill-thrift, increased susceptibility to infection and sudden death. In young (<3 months), un-weaned lambs and kids, a progressive neurological condition (“enzootic ataxia/swayback”) can occur characterized by paresis that progresses from rear limbs to front limbs. Animals with darker hair coats may have poor-quality hair or wool with “graying” due to improper pigmentation. Cu intoxication occurs in both sheep and goats, with sheep being particularly susceptible, and typically results from accumulation of Cu in the liver over a period of time. Underlying liver damage or a stressful event can result in a sudden release of Cu into the blood stream and an acute onset of clinical signs. The most common clinical presentations are acute hemolytic crisis, hematuria, and death with “gun-metal blue” kidneys on necropsy. Both deficient and toxic Cu levels can be associated with poor performance, reduced conception rates, and increased numbers of secondary infections.

Selenium is critical to proper immune system function in addition to red blood cell and tissue integrity. Se deficiency can manifest as ill-thrift, increased susceptibility to infections, and reproductive problems such as infertility, abortions, retained placenta, and stillbirths. White muscle disease is primarily a concern in kids and lambs; however, Se deficient adults may also have muscle degeneration and necrosis. Acute Se intoxication often results in depression and sudden death, especially in sheep. Goats may also demonstrate anorexia, salivation, dyspnea, diarrhea, and paresis, which can mimic many other conditions. Acute Se intoxication most commonly results from improper doses of parenteral Se.

Caseous Lymphadenitis (CL) diagnostics

Caseous Lymphadenitis, CL, caused by *Corynebacterium pseudotuberculosis*, can present a diagnostic challenge in sheep and goats. Abscess material collected via syringe or surgical drainage (external abscesses) or at necropsy (internal abscesses) can be submitted for bacterial culture. Serum samples are tested for CL antibodies with a synergistic hemolysin inhibition (SHI) test. CL abscesses, particularly external ones, can be very effectively protected from the animal’s immune system, resulting in low SHI titers. A 2-fold rise in paired serum samples taken 3-4 weeks apart indicates recent infection. Titers $\geq 1:256$ are rarely seen in animals without internal abscess. Titers 1:8 to 1:128 can be found in both infected and uninfected animals; however, the higher the titer, the more likely an animal is infected. For diagnosis of internal abscess, the SHI test has a sensitivity of about 87% and a specificity of about 80%.

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Your feedback is always welcome. To provide comments or to get additional information on any of the covered topics or services, please contact Sharon Hein at slhein@ucdavis.edu.

We're on the Web
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Plant toxicosis in goats and sheep

As browsers, goats can tolerate a number of plant toxins but are not resistant to all. In a review of plant toxicosis cases at CAHFS from 1990-2007, goats were the affected species in 39 of 996 events. Avocado poisoning, which was the most common plant poisoning in goats (9 cases) results in myocardial necrosis and heart failure; non-lethal exposures can cause mastitis. Currently there is no test for the toxin present in avocado (persin) and diagnosis is based on the identification of leaves in the rumen contents and pathological findings. Leaves are the most toxic components of the plant, although all above-ground structures are toxic, including the fruit. Lupines resulted in the death of 5 of 20 goats within 4 hours of clinical signs. Cocklebur (*Xanthium spinosum*) was the cause of death in four of five brush goats that died with centrilobular necrosis in the liver. The toxic glycoside can be detected in rumen contents and liver. Two cases of cyanide poisoning in goats were attributed to Heavenly Bamboo (*Nandina domestica*) and another was due to ingestion of California Holly (Toyon). Plants toxins known to be excreted in milk include toxins from white snakeroot, rayless goldenrod, fiddleneck and common groundsel (pyrrolizidine alkaloids), locoweeds *Astragalus*, *Oxytropis*, *Swainsona* (indolizidine alkaloids), lupines, poison hemlock, tree tobacco and coffee senna. Plant intoxications in sheep are less frequently identified than in goats, with only four confirmed poisoning cases and eight alkaloid-containing plant ID's performed in this species. Interestingly, oleander poisoning is rarer in goats and sheep than in other species. Experimental studies show that they are as susceptible as other livestock but reports of poisoning by natural exposure are uncommon. If you suspect exposure to a toxic plant in sheep or goats, call CAHFS for a consult on the toxicity and possible diagnostic testing.

Bacterial pneumonia

Two, 4-month-old Boer goats with a 10-day history of dyspnea, lethargy, high fever, and loss of condition submitted for necropsy were diagnosed with bronchopneumonia produced by *Mannheimia haemolytica* and *Mycoplasma spp.* Thirty of 100 goats were ill and 10 had died in the previous week. *Mannheimia haemolytica*, *Bibersteinia (Pasteurella) trehalosi*, and *Pasteurella multocida* are the most common causes of pneumonia in sheep and goats in North America. Several *Mycoplasma* species can also cause pneumonia in goats acting alone or in combination with other bacterial agents. Confirmation depends on post-mortem examination followed by bacterial isolation from the pneumonic lungs; isolation of these organisms from nasal or nasopharyngeal secretions has no diagnostic significance because they can be present in the upper respiratory tract of healthy sheep and goats.



Severe bronchopneumonia in a goat

Mycoplasmosis in goats

Mycoplasmas cause a wide range of clinical conditions in goats such as multiple joint infections, septicemia, pneumonia, mastitis, conjunctivitis and abortion. Carrier animals exist without clinical signs. Kids are more susceptible than adults and are commonly infected by consuming contaminated milk or colostrum. Other sources of infections could be discharges from infected joints and vagina; and ear mites of the external ear canal. Mycoplasma also spread via liners of milking machines, milkers' hands and close association with infected animals. Confirmation of the disease is by culturing the organism from joint fluid, milk, ear swabs or necropsy specimens. Further characterization of the organism can be performed by an outside lab at an additional cost. Hygiene and properly functioning milking machine in the milking parlor are important in minimizing the spread of Mycoplasma. Isolation and treating sick animals and feeding kids pasteurized pooled colostrum are critical in controlling the disease.

Q fever test now available

The CAHFS Davis laboratory is now offering an ELISA antibody test for Q fever (*Coxiella burnetii*). The test can be run on serum, plasma, or milk in any ruminant species. According to published data, the overall sensitivity of this ELISA is estimated at 98.6%, and the overall specificity is estimated at 97.1%, with some variation in these estimates depending on species being tested. The Q fever test has been added to the sheep and goat abortion panels.