

A major factor in the fragile economic balance of the American sheep and goat industry is maintaining disease free herds and flocks. Because accurate diagnosis of infected animals within a herd is essential to disease eradication, Pan American Veterinary Laboratories (PAVL) offers ELISA assays for several diseases found in these ruminants.

The ability to identify infected animals prior to purchase is important in preventing the introduction of disease into a herd or flock. You can be confident in the health of animals from a well-managed herd that has been tested negative by the PAVL ELISA tests. If a herd or flock is infected, the PAVL ELISA tests will identify infected animals. This will enable you to successfully implement proven herd management techniques (i.e. culling, segregation, and vaccination) to eliminate the disease.

By offering assays for all of these diseases in one laboratory, PAVL can provide you with the most state-of-the-art technology at an economical price. A single serum collection and mailing to one location can provide you with diagnostics for any combination of these important diseases.

Pan American Veterinary Laboratories is located in Austin, Texas. Our facility is equipped with state-of-the-art equipment, and a professional staff experienced in ELISA technology. Our technical support staff provides free phone consultation, and ensures that you receive accurate and reliable results in a prompt turn around time.

Caprine Arthritis Encephalitis (CAE) is a disease of goats caused by a retrovirus that is closely related to the OPP virus of sheep. As in sheep, there is no known cure. Clinically infected goats often develop arthritis of the knees. This condition results in swollen, painful joints. Young goats may also exhibit a neurological syndrome consisting of progressive paralysis and other symptoms of brain involvement. It is important to note that many infected goats never show significant symptoms when infected with CAE. Although these "carrier" animals remain asymptomatic, they are a source of infection for other goats in the herd.

The economic effects of CAE in goat herds is a loss of up to 25-30% in milk production, early culling, a shorter life span and reduced growth of offspring.

The primary source of infection is through the colostrum and milk, although direct transmission can occur through animal contact. In utero infection (i.e. doe to unborn kid) is not common. Since a vaccine is not

available, identification of positive animals followed by isolation and/or culling is the most effective method to control spread of the disease. Additionally, heat treatment of colostrum and milk to kill virus has been used extensively to break the cycle of doe to kid infection.

Control program should include testing the entire herd every six months until 2 consecutive negative tests are achieved. Subsequently, annual herd testing should be performed to prevent re infection of the herd. Any new additions to the herd should be tested and found negative, or come from herds that are proven negative of this disease.

The PAVL ELISA test for CAE is based on detection a recombinant protein antigen developed at the U.S. Meat Animal Research Center and a synthetic peptide antigen developed in conjunction with research done at the Pasteur Institute, Paris, France. These two antigens provide sensitive and specificity detection of CAE infection in newly infected and chronically infected goats.

In addition to the blood test for CAE, PAVL is able to test **colostrum samples** for CAE. The highly concentrated antibodies found in colostrum samples collected in the first 24 hours after kidding provide a means to identify those animals which do not consistently test positive on blood samples.

Caseous Lymphadenitis (CL) is a disease common to many species but is of particular significance to sheep and goats. This bacterial infection, which is also known as **infectious abscesses**, is caused by *Corynebacterium pseudotuberculosis*. Abscess of superficial lymph nodes is the most obvious clinical symptom. However, visceral nodes and organs such as the lungs, liver, kidneys, and spleen may also be involved.

Animals gradually become emaciated and lose reproductive efficiency. The economic impact of this disease may be through reduced wool production in sheep or reduced milk production in dairy goats. Economic losses may also occur through carcass trimming and condemnation at slaughter, reduced body weight, and reduced value of goat hides. Animals from infected herds may also have lower value as a replacement stock. This will be important as certification programs for disease free flocks and herds are developed.

In sheep transmission of this disease occurs primarily through contamination of wounds at shearing time or when injuries are incurred around water and feed troughs. In goats oral contamination (licking) leads to infected lymph nodes in the jaw and neck area. An effective

vaccine is now available for sheep but not for goats. Since vaccinated sheep cannot be differentiated from infected animals, sheep should be tested prior to vaccination and the flock divided into positive and negative units.

All new additions to the flock/herd should be tested before vaccination in order to minimize the risk of contamination by an infected but asymptomatic animal. The ELISA available through PAVL detects antibodies specific for the cell wall of the causative bacteria as well as the toxin which this bacteria produces. This test has proven to be both sensitive and effective in the early detection of CL for both sheep and goats.

Paratuberculosis (Johne's Disease) is a disease common to all ruminants. The etiologic agent, *Mycobacterium Paratuberculosis*, localizes in the small intestine mucosa and associated lymph nodes. As the disease progresses, the lining of the terminal small intestine and large intestine becomes thickened. The animal is unable to absorb nutrients and eventually begins to lose protein into the intestinal lumen. The feces may lose their characteristic pellet appearance and become pasty or softer than normal. Depression and dyspnea in goats and shedding of wool in sheep are other symptoms. Affected animals often succumb to secondary bacterial or viral infections due to their weakened condition.

Johne's disease may be transmitted in utero, by ingestion of milk or colostrum from infected animals, or by ingestion of contaminated water or feed. Very young animals are most susceptible to infection.

Intervention strategies should include identification and segregation of infected animals to prevent contamination of clean areas, especially the lambing or kidding areas. The separation of offspring at birth is not effective in controlling the disease. Offspring from infected animals should not be retained for breeding or sold for replacements. Flock/herd management is essential to reduce or to eradicate infection with Johne's disease.

Johne's disease has a very long incubation period. Infection may occur before birth or in animals less than 30 days old, but symptoms generally do not appear until animals are over two years old. AGID and complement fixation tests are effective in detecting infected animals only at the very terminal

stages of the disease. The sensitivity of ELISA tests allow earlier detection of infected animals that can than be segregated from the non infected animals to prevent the spread of this disease. The PAVL Johne's test is simple, rapid, sensitive, and especially useful for herd control and management of Johne's Disease.

Brucella ovis is a disease affecting breeding rams. The most obvious symptoms are swelling and hardness of the testicles associated with orchitis. Other palpable abnormalities in the epididymis and accessory sex glands are also detectable.

The disease results in reduced fertility, prolonged lambing season, increased number of barren ewes, and excessive costs to replace infected rams. The disease is transmitted primarily through homosexual activity among rams in common housing. Identification and removal of infected animals is the most effective strategy for eliminating this disease.

All breeding rams should be evaluated for presence of the disease on a regular basis. Palpation and culture is less effective than ELISA testing. Once a herd has been freed of this disease, a producer should purchase animals only from flocks that are proven negative by ELISA. PAVL offers a highly sensitive ELISA for the detection of antibodies to B. ovis in rams.

Ovine Progressive Pneumonia (OPP) is a disease of sheep caused by a retrovirus. Many retroviruses suppress the immune system, pre-disposing the animal to secondary infections; and once infected, there is no known cure.

Clinical symptoms appear slowly and are more commonly reported in older sheep (3-4 years old). The symptoms include progressive emaciation, labored breathing, predisposition to secondary bacterial pneumonia, indurative mastitis (hardbag), and arthritis.

Economic effects of this disease in sheep are reduced productivity arising from early culling, a shorter life span and reduced growth of offspring. The primary method of infection is through the colostrum and milk, although direct transmission can occur when animals are kept in close confinement. It is important to note that in-utero infection (ewe to unborn lamb) is rare.

Since there is no vaccine for OPP, most breeders depend on identification and isolation of infected animals. Lambs of infected animals may be isolated before nursing and bottle-fed non-infectious milk.

The American Association of Small Ruminant Practitioners recommends testing lambs at six-month intervals followed by culling or segregation of positive animals. Any new additions to the flock should also be tested and found negative, or come from flocks that are proven negative of this disease. A new ELISA test for OPP is now available through PAVL for routine testing or flock clean-up programs.

Q Fever is a rickettsial disease caused by infection with **Coxiella burnettii**. The infection occurs in many species including sheep, goats and man. In sheep and goats this disease causes late term abortions or weakened lambs and kids. The disease is of especial concern because it is highly infectious for man and causes very serious and often life threatening illness. Health problems known to be caused by Q Fever include immediate hypersensitive response including rash, and fever. Severe respiratory distress, which can result in death, is attributed to Q Fever. The effect of chronic **Coxiella burnettii** infection is degradation of the valves of the heart and eventually heart failure.

While Q Fever has detrimental economic effects due to lowered kidding and lambing rates and lower growth rates of infected animals, the major concern is human health problems. Birthing fluids and membranes from infected animals typically contain high levels of infectious organisms which can be transmitted by simple contact. Contact is likely to occur with stillborn or weak lambs or kids. Handling and resuscitation of newborn or stillborn kids or lambs is an excellent opportunity to become infected.

In order to avoid these human health hazards it is important to test each animal in the herd annually for Q Fever infection.



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