

# Ovine Progressive Pneumonia

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## Introduction

Ovine progressive pneumonia (OPP), called maedi-visna in Europe, is a slow viral disease of sheep which causes chronic, debilitating pneumonia and wasting. It is related to a similar virus in goats called caprine arthritis and encephalitis virus. This progressive emaciation is sometimes referred to as “thin ewe syndrome”, however the infection may also cause respiratory disease, mastitis (“hard bag”), neurologic problems, and arthritis. The arthritis typically appears in the knee and hock joints causing thickening and mineralization of the joint capsule as well as deterioration of the cartilage and bone. Adults of any age can be affected, but it is typically seen in 2 to 3 year old sheep. Affected animals may continue to eat, but show signs of exercise intolerance, rapid and/or open mouth breathing, and coughing. Those ewes that do lamb often have small, weak offspring. Transmission of the virus occurs through ingestion of colostrum by lambs, nose to nose contact between animals, and, rarely, via the uterine circulation in pregnant ewes. All breeds of sheep are susceptible. Death

after prolonged disease is the usual outcome.

## Diagnosis and Testing

It is important to differentiate this disease from *Mannheimia* pneumonia, lungworms, *Corynebacterium pseudotuberculosis* infection (caseous lymphadenitis), and adenomatosis. The NDSU Veterinary Diagnostic Laboratory can help diagnose this condition in the individual animal (necropsy) or the flock (serology). In a live animal, the best samples to submit for a respiratory workup include a nasal swab, a whole blood sample and a serum sample. The nasal swab will help identify bacteria and/or viruses that may be contributing to the problem, the whole blood sample can be used for virus isolation, and the serum sample can be used to look for antibody to an infectious agent. If an animal has died, then tissue samples can increase the chances of identifying the problem. Post mortem samples from the respiratory tract should include lung tissue, trachea, and tracheobronchial lymph node. Representative samples should be submitted fresh and chilled as well as fixed in formalin. Contact your

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veterinarian or call the Veterinary Diagnostic Laboratory for assistance with this process. Two types of serologic test are generally available. The agar gel immunodiffusion test (AGID), and the enzyme-linked immunosorbent assay (ELISA). The AGID is simple and cheap; however the ELISA is more sensitive and able to detect animals with the infection earlier. Currently, there is not a commercial OPP ELISA available; therefore laboratories that offer this assay have developed and validated their own test. Commercial AGID tests are available and widely used. The AGID test detects antibodies to the virus, but usually not before the infection has been in place at least 6 months. In lambs, any antibody acquired from the ewe in colostrum should be out of the blood by the time the lamb is 6 months old, therefore a positive test in a lamb less than 6 months old should be regarded as inconclusive. The lamb should be retested again after it reaches six months of age. A negative AGID either means no infection, or that the antibody in the blood has dropped to undetectable levels. Negative tests should be repeated in a few months to insure that an animal maintains its negative status. A positive AGID indicates infection, but gives no information on the status of active disease in the

animal. A positive test will have more meaning in an animal with clinical signs of respiratory disease, but it is not conclusive evidence that the cause is the OPP virus. Animals will test positive approximately one month after exposure to the virus. Not all sheep testing positive for OPP antibody will develop clinical disease, therefore it becomes difficult to know when to cull animals. However, because an infected animal can shed the virus into the environment, it is best to remove any antibody positive animals from the herd.

### **Treatment and Control**

Antibiotics can be used to treat secondary infections but there is no effective treatment or vaccine available for OPP infections. While it is impossible to completely avoid the possibility of infection, particularly if you show sheep, there are some things that can be done to minimize risk. Use your own buckets and tubs to feed and water your stock. Minimize nose-to-nose contact between your stock and other sheep. When possible, transport your own animals to and from shows and sales. Accurate health papers and animal identification are important. When mouthing sheep it might, in some situations, be a good idea to disinfect hands between animals.

Control is managed through two general methods. Producers may test for antibody and cull any positive reactors from the herd. Retesting is recommended on an annual or semi-annual basis to insure that animals which seroconvert later do not infect the herd. Alternatively, lambs may be removed from ewes before they nurse and be reared using colostrum from seronegative sheep or heat-treated sheep colostrum, and then raised on milk replacer, milk from seronegative ewes or heat-treated sheep milk. OPP is a persistent, progressive viral infection in sheep that must be managed as there is no effective treatment or vaccine available to the producer.

### **Literature Cited**

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