

## TESTING SHEEP AND GOATS FOR *Mycoplasma ovipneumoniae* (Movi)

Bighorn sheep were historically widespread in the steep canyons of Western North America. In the past century, these majestic animals have been brought back from the brink of extinction by wildlife agencies, tribes, and wildlife advocates. Currently, the biggest threat to bighorn sheep is an oftentimes fatal pneumonia caused by bacteria carried by domestic sheep and goats.

Recent research has identified *Mycoplasma ovipneumoniae* (Movi) as the infection that typically triggers bighorn sheep pneumonia outbreaks. Movi is commonly carried by healthy-appearing domestic sheep and goats, but infection of bighorn sheep may kill up to 80% of the herd in the initial outbreak alone.

Movi also causes problems in domestic sheep and goats. Fatal pneumonia,

though uncommon, invariably involves Movi infection. More commonly, Movi infects weaned lambs and kids, causing a coughing syndrome and decreased rate of gain. No Movi vaccine is available for bighorn sheep or for domestic sheep or goats.

Keeping domestic sheep and goats separated from their wild cousins in the most effective way to prevent this pneumonia in bighorns. A wandering bighorn ram may join a group of domestic sheep or goats, or a stray sheep or goat may join a bighorn herd; either case presents a risk of pathogen transmission. A single contact between a bighorn sheep and a domestic sheep or goat can trigger a pneumonia outbreak in bighorns, causing multiple mortalities.

Testing for Movi can help the sheep or goat owner determine whether their herd represents a risk to nearby bighorn sheep.

### Step 1: Sample the herd

The actual process of sampling is quick and easy: Using a synthetic swab (not cotton tipped) with a plastic shaft (not wood), insert the swab deeply into each nares in turn. Then simply replace the swab in its sheath, taking care to avoid touching it to other animals or



Photo by Laura Heinse

surfaces, and keep it cool (refrigerator temperature preferred) until it can be shipped to the lab.

How many animals should be sampled? If the goal of sampling is to determine the herd status of large herds, sampling a subset of 10-20 animals will provide an estimate of the percentage of animals carrying Movi. If the goal is to identify individual carrier animals for a test and segregate approach to eliminate Movi from the herd, all the animals in the herd should be sampled, and the Movi negative group should be re-sampled at least once, 2-weeks or more after the initial sampling.

### Step 2: Submit the samples

WADDL is currently the only US fee-for-service laboratory that provides PCR testing for Movi. Nasal swabs should be submitted to WADDL with a completed accession form and an identification form for multiple animals; both forms are



Photos by David Volsen

available from the WADDL website ([waddl.vetmed.wsu.edu](http://waddl.vetmed.wsu.edu)). Tick the PCR box in the tests requested section, and indicate you are requesting Movi PCR. Up to date information about WADDL testing can be found on the same website under the “Animal Disease FAQ” tab under “Mycoplasma ovipneumoniae diagnostics in domestic and wild sheep and goats”.

### Step 3: Follow up with owner

If the herd is Movi-free, the owner should be advised that to keep this status they will need to operate a ‘closed herd’, avoiding contacts with potentially M.ovi-infected sheep or goats. Helpful guides on good biosecurity practices can be found at <https://tinyurl.com/yb4hru86> (USDA APHIS) or at <https://tinyurl.com/y86gazve> (American Sheep Industry).

## Ordering supplies

**Movi broth** can be ordered at Hardy Diagnostics: Catalog #R102  
\$40+shipping for 20 vials

<http://www.hardydiagnostics.com/>

Note: Samples can be stored and sent without the broth).

**Nasal swabs** can be ordered at Andwin Scientific, catalog #B220144  
\$120-130 plus shipping for 100 swabs

## Questions

### WADDL

PO Box 647034  
Washington State University  
Pullman WA 99164-7034  
509-335-9696

### WSU-WADDL

155N Bustad Hall  
Pullman, WA 99164-7034

APHIS Veterinary Services  
Center for Epidemiology and  
Animal Health Mycoplasma  
ovipneumoniae on U.S. Sheep  
Operations Info Sheet (2015).

[http://www.aphis.usda.gov/animal\\_health/nahms/sheep/downloads/sheep11/Sheep11\\_is\\_Myco.pdf](http://www.aphis.usda.gov/animal_health/nahms/sheep/downloads/sheep11/Sheep11_is_Myco.pdf)

Returning from exhibitions of other situations where they may have contracted other sheep or goats should be isolated from resident animals for 4 weeks and then retested to confirm Movi-negative status.

If a herd is currently Movi-infected, the owner can be advised about methods to eliminate this bacterium. These methods are under development, so may require modification to take herd-specific factors into account. Some factors include:

- Herds and flocks vary widely in the percentage of Movi carriers. Culling *M.ovi* carriers will greatly reduce the risk the operation poses to bighorn sheep but may be unacceptable if the percentage of carriers is high. Alternatively, Movi non-carriers may be segregated from Movi carriers (provided the available facilities permit). Non-carriers will produce lambs that have not been exposed to Movi.
- Lambs and kids typically remain uninfected with Movi for a considerable time after birth. Data show this is typically about 2 months, although in some herds can be 6-months or longer. However, infection of animals younger than 2-months of age does also occur in some herds. Segregation at weaning can be an effective means of producing Movi-free kids and lambs if done prior to the age of Movi infection. This approach may be more effective if combined with medication at the time of segregation; see next bullet.
- Recently we have seen promising results with certain antibiotic treatments, which may be applicable even to operations with large numbers of Movi carriers. However, the optimal drugs, routes and durations of treatment are still in development.
- Whatever methods are used to eliminate Movi from groups or entire herds, re-testing will be required to confirm success. Movi infection is a dynamic process, and some animals may be incubating infection at the time of segregation, so follow up testing is required to detect and segregate, cull, or treat animals to achieve the Movi-free goal.

*Revision May 13, 2019. Produced collaboratively by the Washington Department of Fish and Wildlife and the WSU College of Veterinary Medicine.*