Use of Rapid Field-Based PCR Testing to Detect *Mycoplasma ovipneumoniae* Infection in Bighorn Sheep

SMRITI SHRINGI, *Washington State University Department of Veterinary Microbiology and Pathology, PO Box 647040, Pullman, WA, USA 99164*

THOMAS E. BESSER, *Washington State University Department of Veterinary Microbiology and Pathology, PO Box 647040, Pullman, WA, USA 99164*

ABSTRACT: *Mycoplasma ovipneumoniae* (Movi) induced epizootic pneumonia has resulted in significant declines in bighorn sheep (*Ovis canadensis*, BHS) populations in the USA. Testing of BHS nasal swabs with real-time PCR (RT-PCR) for Movi infection has proven valuable in epidemiologic and ecologic studies of the disease but does not produce results in time to support individual animal management actions without special arrangements for animal holding. The objective of this study was to evaluate rapid, animal-side testing using RT-PCR (Biomeme, Inc.) to detect Movi in sheep nasal swabs. Duplicate nasal swabs were collected from 53 BHS in Hells Canyon. Animals were considered positive if Movi was detected in either or both swabs. DNA was extracted from one swab using Biomeme reagents and analyzed in the field using the Biomeme RT-PCR instrument/two3 PCR machine (B-DNA/B-PCR) and the second swab was extracted and tested by Conventional laboratory analysis (C-DNA/C-PCR). Movi was not detected using B-DNA/B-PCR in any of the tested BHS, while C-DNA/C-PCR detected Movi in 2 animals. C-PCR detected Movi using B-DNA from one of these two animals. Biomeme and conventional laboratory PCRs were also used to test duplicate nasal swabs from 33 domestic sheep (DS). B-DNA/B-PCR detected Movi in 58% (19/33), compared to 64% (21/33) for C-DNA/C-PCR. Movi was detected by B-DNA/B-PCR in two DS that were negative by C-DNA/C-PCR, while C-DNA/C-PCR detected Movi in four DS that were negative by B-DNA/B-PCR. C-PCR also detected Movi using B-DNA from these latter four animals. In all, 86 BHS and DS were tested by B-DNA/B-PCR and C-DNA/C-PCR; Movi was detected in 25 animals by one or both methods. Considering these 25 animals as 'true positives', the diagnostic sensitivity for Movi detection was 76% for B-DNA/B-PCR and 92% for C-DNA/C-PCR. Results indicated that swab-to-swab variation in sampling and the presence of inhibitory substances in DNA extracts contributed to the imperfect sensitivity of both tests. This study demonstrates the field applicability of Biomeme test and identified areas where improvement is needed.

Biennial Symposium of the Northern Wild Sheep and Goat Council 21:117; 2018

KEY WORDS Bighorn sheep; *Ovis canadensis*; pneumonia; *Mycoplasma ovipneumoniae*; domestic sheep; real-time PCR; animal-side test development.