Pneumonia in Bighorn Sheep: A Recent Review

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ABSTRACT: In this presentation, we review the literature and recent unpublished data to present a brief overview of the biology and management of pneumonia in bighorn sheep. Association of domestic sheep has long been linked to pneumonia outbreaks in free-ranging bighorn sheep and has been confirmed in 13 captive commingling experiments. Epizootic pneumonia in bighorn sheep is polymicrobial but *Mycoplasma ovipneumoniae*, a bacterium

specific to *Caprinae* and commonly carried by healthy domestic sheep and goats, appears to be a necessary primary agent. All-age epizootics following introduction of *M. ovipneumoniae* along with other pathogens into bighorn sheep populations are usually severe (median mortality 48%) but fatality rates vary widely, from 5 – 100%. Disease outcomes may be influenced by the strain of *M. ovipneumoniae*, by co-infection with other bacterial and viral pathogens, and by factors associated with transmission and host immunity. Once introduced, *M. ovipneumoniae* can persist in bighorn sheep populations for decades. Carrier dams transmit the pathogen to their susceptible lambs, triggering fatal pneumonia outbreaks in nursery groups, which limit recruitment and slow or prevent population recovery. The result is that demographic costs of pathogen persistence often outweigh the impacts of the initial introduction. Strain typing suggests that spillover of *M. ovipneumoniae* into bighorn sheep populations from domestic small ruminants is ongoing, and that consequences of spillover are amplified by movements of infected bighorn sheep across populations. Current disease management strategies focus on reducing risk of spillover from reservoir populations of domestic sheep and goats and on limiting transmission among bighorn sheep. A broad array of approaches has been tried and more are needed to prevent pathogen introduction, induce disease fadeout in persistently infected populations, and promote population resilience across the diverse landscapes bighorn sheep inhabit.

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