Age Dynamics and Chronic Carriage of *Mycoplasma ovipneu*moniae Infection in Adult Domestic Sheep

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ABSTRACT: Bighorn sheep (*Ovis canadensis*) populations have declined across their range due in part to pneumonia caused by *Mycoplasma ovipneumoniae*. Spillover of *M. ovipneumoniae* from domestic to wild sheep can initiate epizootics of respiratory disease. Some survivors become chronic carriers of *M. ovipneumoniae* leading to a cycle of new lamb infection and poor recruitment. Work on age dynamics in bighorn sheep shows that the youngest and oldest animals are most susceptible to infection. However, the relationships between age and chronic carriage of *M. ovipneumoniae* have not been well-explored. We seek to address this knowledge gap in domestic sheep: to what extent are age and chronic carriage related? We hypothesize a negative relationship between age and chronic carriage if carriers are more susceptible to other diseases and concomitant shorter lifespan. Alternatively, the age-carriage relationship may be positive because older animals are more likely to eventually become infected and become a chronic carrier. A third hypothesis is a non-linear relationship combining the first 2: sheep of intermediate ages are most likely to be chronic carriers. This is an ongoing study involving serial collection and testing of nasal swabs from 40 Suffolk adult domestic ewes (ages 2–11 years). Infection status is determined using real-time Polymerase Chain Reaction (PCR) and chronic carriers are classified as those with consecutive positive tests. We also consider reproductive status and travel history as factors that may contribute to infection status and chronic carriage. Understanding the dynamics of chronic carriage in domestic sheep is important for identifying individuals at higher risk of inducing spillover to bighorn sheep or in managing infection within domestic herds by removing key chronic carriers.

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