

Low Q-fever seroprevalence in Western Australian and South Australian ewes

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Coxiella burnetii is an intracellular bacterium that causes Q-fever in animals (including livestock) and humans. Q-fever is a notifiable zoonotic disease, most commonly reported in farm and abattoir workers. In sheep, infection can cause abortion and the birth of weak lambs less likely to survive. *Coxiella burnetii* is considered endemic in Australia, but prevalence in sheep and contribution of Q-fever to reproductive wastage in ewes are not well described. The aim of this study was to determine *C. burnetii* seroprevalence in sheep from Western Australia (WA) and South Australia (SA), and determine if exposure to *C. burnetii* is associated with abortion and perinatal lamb mortality.

Maiden ewes aged 7-20 months from 11 flocks on 10 farms (approximately 200 ewes per flock) from WA and SA were monitored throughout pregnancy. Reproductive success was determined based on two pregnancy ultrasounds (76-88 and 116-119 days from initial exposure to rams), number of lambs born, number of lambs marked and lactation status at marking. A subset of maiden ewes identified as pregnant but failed to rear a lamb (approx. n=40 per farm) plus mature ewes (4 years or older, n=20 per farm) were screened for anti-*C. burnetii* IgG by indirect ELISA (ID Screen Q-Fever Indirect Multispecies, ID Vet, France). Maiden ewes at Farm 3 were sampled in 2018 (3a) and 2019 (3b). Aborted and stillborn lambs were collected during the lambing period for the maiden ewe study flocks and tissue samples were screened for *C. burnetii* using qPCR. Seroprevalence 95% confidence interval was determined using Jeffreys method.

Figure 1: *Coxiella burnetii* seroprevalence in maiden ewes (n=500) and adult ewes (n=200) from 10 farms in WA and SA.



Coxiella burnetii individual animal seroprevalence was 0.16% (95% confidence interval 0, 0.7). Seroconversion was identified in only a single maiden ewe from one farm in SA (Figure 1). *Coxiella burnetii* was not detected in any tissue samples from 35 aborted or stillborn lambs recovered from maiden ewes.

These findings suggest *C. burnetii* infection was unlikely to explain abortion and perinatal mortalities observed for maiden ewes on these farms, and exposure to *C. burnetii* was not widespread in sheep from these regions of WA and SA. This was consistent with a previous study that found no evidence of seroconversion in sheep from a WA farm (Banazis et al., 2010). In contrast, seroconversion was reported in 7/39 Victorian sheep flocks that had within flock seroprevalence ranging 10-30% (Tan et al., 2017). The investigation is ongoing and will be expanded to include Victorian farms. Findings will determine the impact of this endemic infectious disease on sheep reproductive performance, and inform recommendations for sheep management aimed at improving reproductive performance for maiden ewes. Further to this, improved understanding of the role of sheep as a source of *C. burnetii* infections will inform recommendations for managing zoonotic risk in susceptible people.

References

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