

Are abortigenic parasites an important contributor to reproductive wastage in maiden ewes?

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Toxoplasma gondii and *Neospora caninum* are apicomplexan parasites. Infections in naïve ewes may cause abortion and the birth of weak lambs that are less likely to survive (Dubey, 2009; Dubey and Schares, 2011). *In utero* foetal losses during mid- and late gestation can contribute to reproductive wastage in young ewes. Both of these parasites are considered endemic in Australia, however their role in reproductive wastage in ewes remains unclear. The aim of this study is to determine if abortigenic parasites are associated with reduced reproductive performance in maiden ewes.

Maiden ewes aged 7-20 months from 11 flocks on 10 farms (approximately 200 ewes per flock) in Western Australia (WA) and South Australia (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. *Toxoplasma gondii* and *N. caninum* seroconversion was determined for a subset of maiden ewes identified as pregnant but failed to rear a lamb (n=40-100 per flock) plus mature ewes (4 years or older, n=20 per farm) using indirect ELISA (ID Screen Toxoplasmosis Indirect Multispecies and ID Screen *Neospora caninum*, ID Vet, France). Aborted and stillborn lambs were collected during the lambing period and tissue samples were screened for *T. gondii* using qPCR. Seroprevalence 95% confidence interval (CI) was calculated using Jeffreys method. Seroprevalence (proportion positive samples) were compared using 2-tailed z-test.

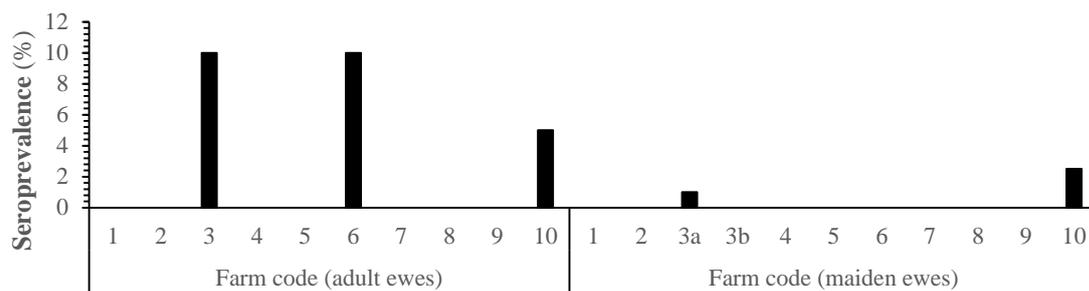


Figure 1: *Toxoplasma gondii* seroprevalence for maiden ewes (n=500) and adult ewes (n=200) from 10 farms in WA and SA

Overall *T. gondii* seroprevalence was 1.1% (95% CI 0.5, 2.1). *Toxoplasma gondii* seroconversion was identified on three farms where seroprevalence ranged 0-2.5% in maiden ewes and 5-10% in mature ewes (Figure 1). Seroprevalence was higher ($P=0.02$) in mature ewes (2.5%; 95% CI 1.0, 5.4) than maiden ewes (0.5%; 95% CI 0, 1.5). *Toxoplasma gondii* was not detected in any tissue samples from 35 aborted or stillborn lambs recovered from maiden ewes. There was no evidence of *N. caninum* seroconversion on any farm.

Findings suggest *T. gondii* or *N. caninum* exposure is unlikely to explain abortion and perinatal mortalities identified in maiden ewes on these farms. Low *T. gondii* seroprevalence was in contrast to previous studies that have identified seroconversion in up to 34% individuals (Kiermeier et al., 2008) and 95% of flocks (O'Donoghue et al., 1987) in WA and SA. This investigation is ongoing and will be expanded to include Victorian farms. Findings will determine the impact of these parasites on sheep reproductive performance and inform recommendations for sheep management aimed at improving reproductive performance for maiden ewes.

References

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