Introduction

- Globally, infections of the obligate intracellular pathogen *Chlamydia pecorum* in sheep are poorly understood, despite a growing evidence that these infections are almost ubiquitous.
- In Australia, 30% of the nation’s sheep shed *C. pecorum* faecally [1], in both healthy and diseased animals (Fig 1)[2].
- Discrepancies in chlamydial shedding and seropositivity as well as CFT and PCR diagnostic tests lead to under-diagnosis of these infections.

Objective

We aim to understand the diagnosis, impact and dynamics of *C. pecorum* infections in a commercial sheep flock from 2 months (marking) to 10 months (finishing) of age by:

- Assessing the longitudinal prevalence of *C. pecorum* infections across different anatomical sites.
- Comparisons of complement fixation test (CFT) and qPCR as diagnostic tools for veterinary testing of *C. pecorum*.

Methods

- The study follows a cohort of 105 mixed sex lambs in a commercial sheep farm in Central NSW.
- Plasma and swabs from conjunctival, vaginal and rectal sites sampled every two months.
- Diagnosis of *C. pecorum* infections by CFT and qPCR targeting the *C. pecorum* 16S rRNA region.
- CFT carried out on blood plasma at Elizabeth Macarthur Agricultural Institute.
- Statistical analysis was done using the R software.

Results

1. 58% of the flock seroconverted at 6 months by CFT, early onset and detection of infections by qPCR

2. 83% of flock infected with *C. pecorum* - 83% infection clearance only in females at 10 months of age

<table>
<thead>
<tr>
<th></th>
<th>PCR+ CFT+</th>
<th>PCR+ CFT-</th>
<th>PCR- CFT+</th>
<th>PCR- CFT-</th>
</tr>
</thead>
<tbody>
<tr>
<td>Combined</td>
<td>95</td>
<td>0.83</td>
<td>0.08</td>
<td>0.04</td>
</tr>
<tr>
<td>Female</td>
<td>48</td>
<td>0.90</td>
<td>0.04</td>
<td>0.06</td>
</tr>
<tr>
<td>Male</td>
<td>47</td>
<td>0.77</td>
<td>0.13</td>
<td>0.02</td>
</tr>
</tbody>
</table>

Table 1. Sensitivity and specificity of CFT relative to PCR, lag of CFT in months following PCR detection, lambs that cleared their infection by 10 months.

3. Conjunctival infections predominant in lambs that could not clear infections or remained infected by 10 months of age

Results (Contd.)

Fig 3. Infection location characteristics of animals that remain infected at 10 months, and females that cleared their infection by 10 months of age.

Conclusion

- PCR is more sensitive at early time points of infection (2-4 months) followed by CFT during later time points for *C. pecorum* detection.
- Almost ubiquitous presence of *C. pecorum* infections.

Future directions

- Analysis of the health impacts for individual lamb and the flock are ongoing.
- Comparisons of the humoral immune responses of lambs with different infection outcomes using recombinant immunogenic chlamydial proteins.
- Molecular epidemiology of the longitudinal infections to understand strain-specific disease outcomes.

References