***Application***

*Anaplasma phagocytophilum* is present in the Irish sheep flock and should be considered as a contributor to morbidity and mortality in tick infested areas.

***Introduction***

*Anaplasma phagocytophilum* causes the disease known as Tick Borne Fever in ruminants. It is associated with general malaise, lack of production, fever, respiratory signs, and immunosuppression leading to co-infection with other infectious diseases such as Louping Ill and Tick Pyaemia in sheep. It is also a cause of infectious abortion in sheep. Little is known about the prevalence and significance of *A. phagocytophilum* in the Irish national sheep flock. The aims of this study were two-fold. Firstly, to assess the prevalence of *A. phagocytophilum* in lamb carcases submitted to 3 Irish Regional Veterinary Laboratories in 2021 and 2022 using real-time qPCR and to determine if there was an association between PCR positivity and co-morbidities. Secondly, to estimate the flock-level prevalence of *A. phagocytophilum* in Irish sheep flocks using a commercial inhibition elisa.

***Materials and methods***

A sample from the spleen of every lamb submitted to three Irish Regional Veterinary Laboratories (Sligo, Athlone and Kilkenny) in the calendar years of 2021 and 2022 was analysed by real-time qPCR. Postmortem data, detailing age and diagnosis were recorded for each animal. Chi-square and Multiple Correspondence Analysis (MCA) was carried out to identify relationships between *A. phagocytophilum* PCR status and other concomitant findings.

To determine the flock seroprevalence of *A. phagocytophilum*, pools of 5 sera from 376 flocks collected in 2019 were analysed using the Anaplasma antibody competitive elisa Test Kit, (VMRD, Pullman, WA 99163 USA). 36 positive and 36 negative flocks were subsequently tested individually to determine within-flock prevalence. ROC and AUC characteristics were then employed to determine the optimal cut-off for use on pooled samples.

***Results***

PCR analysis of lambs submitted for PM analysis showed that pneumonia accounted for 22.8% of the primary cause of death in TBF-positive lambs and 13.9% in TBF-negative lambs. Pneumonia causing bacteria from the family Pasteurellaceae were identified in 33.3% of TBF positive samples and 17.7% of TBF negative samples.

ROC and AUC analysis indicated that using a 2% inhibition cut-off was optimal when using the commercial ELISA to test pooled serum samples compared with a 30% cut-off for use on individual samples recommended by the manufacturers. When a 2% pooled cut-off was employed the national flock level seroprevalence was 28.2% with positive flocks tending to be located in areas where ticks are known to be present.

***Conclusions***

*A. phagocytophilum* is a significant disease in Irish sheep flocks located in areas suitable for ticks. This study suggests that infection with the organism may lead to an increased susceptibility to particular infectious diseases such as pneumonia caused by *Mannheimia haemolytica*.

Acknowledgements

This project was part-funded by the Teagasc Walsh Fellowship