

## Occurrence of *Cryptosporidium* in UK sheep

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The protozoan parasite *Cryptosporidium* infects a wide range of animals, including humans, across the world. However, there is a paucity of data on the presence of this parasite in livestock in the United Kingdom. We therefore investigated the occurrence of *Cryptosporidium* spp. in sheep at two farm locations in North West England using a combination of classical parasitological and molecular approaches.

Across 2015-16, a total of 552 faecal samples were collected from female sheep (Swaledale and Herdwick breeds) reared at two farms in South Cumbria. DNA extractions have been performed on the faecal samples and the presence of *Cryptosporidium* parasites confirmed by successful PCR amplification targeting either the 18S rRNA gene, or the actin gene. In total, 99 samples (17.9%) were confirmed positive, and 94 of these were typed to species level by sequencing of the PCR products. The most common species was found to be *C. xaiio*; other species noted, in decreasing order of prevalence, were: *C. ubiquitum*, *C. sp.* and *C. parvum*. Analysis of the *C. ubiquitum* isolates by PCR amplification of the gene encoding GP60 confirmed that they were all the same subtype (XIIa). Infections in 55 of the 99 PCR-positive samples were also confirmed using staining (cold Kinyoun's ZN stain) and microscopy. A qPCR-based approach targeting the 18S rRNA gene was then utilized to assess parasite infection loads. The maximum and minimum *Cryptosporidium* infection loads (oocysts per gm<sup>-1</sup> faeces) were confirmed as 43,000 and 1 respectively.

Overall, the data confirms that different *Cryptosporidium* species are present in UK sheep, that prevalence levels are relatively high and that these livestock may potentially act as a reservoir of zoonotic disease. We are now investigating potential environmental sources of *Cryptosporidium* infection in the study area.