The circadian cycle of oocyst shedding of *Eimeria* spp. affecting brown kiwi (*Apteryx mantelli*)

Operation Nest Egg (ONE) is an important tool for kiwi conservation with kiwi eggs being removed from the wild, hatched in captivity and raised through to a predator-resistant weight (~1kg) before being released. However as hatcheries and rearing centres result in a high density of young, immunologically naive kiwi being reared in semi-captive conditions environmental build up of pathogens, such as coccidia, occurs with a resultant increased risk of disease. Coccidia are protozoal parasites that cause weight loss, diarrhoea and death and significant morbidity and mortality from coccidia has been reported in numerous populations of kiwi, in particular those housed in captivity or kiwi crèches. At least four species of coccidia affecting kiwi are of the genus *Eimeria*. At present little is known about how coccidia behaves in kiwi and it is imperative that our understanding improves to enable appropriate disease management to reduce its detrimental impact on kiwi and ensure the success and sustainability of ONE.

At present much of what we base coccidia testing and treatment programmes on for kiwi is extrapolation from the extensive knowledge of *Eimeria* spp. in commercial chickens, however with the kiwi's unique evolutionary history and drastically different biology and ecology, it is likely that some of what holds true for coccidia in chickens may not apply for coccidia in kiwi. Understanding the host/parasite interaction is key to developing effective management plans and it is for that reason that I intend to investigate the diurnal shed of coccidial oocysts in kiwi. It is well documented in other bird species that coccidial oocysts are shed in the faeces at different times of the day in order to maximise the potential for intra-specific host ingestion. Due to the nocturnal lifestyle it is likely that this pattern is different for kiwi, thereby impacting the accuracy of faecal oocyst counts depending on the time of the day the sample was collected.

The aim of this research is to describe the cycle of coccidia oocyst shedding in brown kiwi as well as describing any newly encountered morphological types of coccidia. In order to achieve this individual kiwi at rearing centres will be monitored throughout a 24 hour period via regular enclosure searches for faecal samples. Samples will be tested to determine the times during which the peak number of coccidia oocysts are shed . Oocysts from collected samples will be sporulated using potassium dichromate and compared with previously described oocysts found in kiwi and any novel types will be described morphologically.

The results of this research will allow kiwi managers and wildlife veterinarians to better manage coccidia in juvenile kiwi, being able to more confidently interpret faecal egg counts as part of a management programme. It is hoped that managers can use this information to construct a comprehensive coccidia management plan involving accurate testing in order to limit the effects of coccidia in a sustainable and evidence based manner.

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