



Libyostrongylus douglassii (wireworm)

identified in ostriches

The ostrich parasite, *Libyostrongylus douglassii* was recently identified in samples from ostriches with clinical signs of parasitism. The parasite has been identified by a parasitologist using in-vitro larval culture and examination of the adult parasite morphology. This was the first identification of this organism in New Zealand. *Libyostrongylus* infection was declared unwanted in 1998 and should be reported to MAF via the exotic disease free-phone: **0800 809 966**

The parasite is a well known pathogen of commercial significance overseas. Ostriches were farmed in New Zealand at the turn of the century for the feather fashion trade. Modern ostrich farming commenced in 1993 with the importation of eggs followed by birds in 1995. Live ostrich have not been imported since 1996. Early indications are that the infestation has been present for many years and given the history of active transport in the industry, is probably widely distributed.

On the index farm, a severe clinical picture with high morbidity and mortality was observed. The farmer estimated mortality rates over the last 18 months to be 50% in chicks, 20% in juveniles, and 10% in adults. Clinical signs or wasting/ill-thrift occurred in 10% of the birds and weakness in 3%. Weakness was exhibited in a variety of ways. Chicks were reluctant to move. They were unable to support their head easily and developed a "hockey-stick" neck due to the muscles of the neck forming a more sigmoid flexion as the cervical vertebrae bear more weight. Adults moved more slowly and were less aggressive. Where parasitism was excessive, the birds became recumbent and died. Other clinical signs included:



Chick with characteristic bent neck, because birds become weak and muscles cannot support the head.

- Anaemia.
- Break in the vane of the feathers - indicating significant stressor in previous 2 months.
- Decreased egg production.
- Recumbency, constipation, dehydration and rapid weight loss despite good appetite.
- Marked variation in adult bird size and body condition.

Gross post-mortem findings included:

- Atrophy of muscles overlying the synsacrum and ischium.
- Cachexia - serous atrophy of pericardial fat and abdominal fat deposits.
- Hypertrophy and erythema of the glandular mucosa of the proventriculus.
- Abnormal length grass in the proventriculus and gizzard - gastric stasis.
- Distended large intestine with dry faecal content - constipation.
- Excessive mucus in the oesophagus and pharynx.
- Diptheritic membrane over the mucosal surface of the proventriculus.



Diptheritic membrane over the mucosal surface of the proventriculus

Diagnosis can be made by taking faeces for larval culture or the recovery of fresh and formalin fixed proventriculus at post mortem or slaughter. Adult parasites can be visualised by placing 2-4 pieces (roughly 2-3cm diameter) of suspect proventricular material in a petri dish, and examining these under a stereo microscope - the red/brown worms are readily seen. Culture of larvae is necessary to differentiate *L. douglassii* from eggs of the largely non-pathogenic ostrich caecal worm, *Codiostomum struthionis*.

Eggs and first stage larvae in faeces can survive desiccation for 30 months in South African conditions. Given such resilience, New Zealand's environment would be favourable to its persistence. A range of on farm and pre and post movement measures can be used to break the parasite lifecycle and prevent further dissemination.

There are no currently registered anthelmintics with claims for use in ostriches in New Zealand, although a number common anthelmintics have been tested and found to be efficacious against *L. douglassii* elsewhere. These include fenbendazole at 15 mg/kg, levamisole at 30 mg/kg and ivermectin orally at 0.2 mg/kg or as a subcutaneous injection, at 0.3mg/kg kg.

The usual recommendations regarding drench usage should also be applied with particular attention being paid to dose rates, alternation to avoid resistance, and obligatory meat withholding periods (60 days) for ex label use.

The prepatent period is 33-36 days. In order to break the life cycle, treatment with anthelmintics should be conducted every 28 days in heavily infected premises. Faecal egg counts should be monitored to determine the need and timing of such treatments. Resistance is likely to develop more readily with the first product.

The main thrust of control procedures on contaminated farms should be directed towards parasite management and reducing the exposure of younger more susceptible birds to infection. Maintain juvenile birds separately from infected adults and keep them away from contaminated pasture. The time of first infection depends on when a chick starts pecking at material contaminated with *Libyostrongylus* eggs. Contaminated pastures can be cleaned up by grazing with another species of livestock, removal in the form of hay or silage, and resowing.

Uninfected farms can be protected by immediately testing and treating any incoming birds on arrival and placing them in isolation for 5 weeks. During this quarantine period, faeces should be removed daily. If faecal egg examinations performed at the time of introduction and again after the five weeks are negative, then the birds can be safely introduced into the flock.

L. douglassii is considered to be a parasite of only the ostrich, but its potential for cross transmission to other birds, particularly other ratites such as kiwi has not been investigated.

Empirical evidence suggests kiwi are not infected. Massey University performs post-mortem examination on all dead kiwi submitted by DOC. To date, no cases of diphtheritic proventriculitis have been detected.

The lack of records of *Libyostrongylus* infections in other more closely related ratites such as emus and cassowaries in Australia, where ostriches have been present for over 100 years suggests that cross-transmissions if they do occur are infrequent. MAF is working with DOC to determine potential areas of overlap of kiwi and ostrich premises and to enhance surveillance. A transmission trial is under consideration.

For detailed information concerning wireworm see the comprehensive literature review by Phil McKenna at: www.maf.govt.nz/wireworm.

An article will be published in the September 2004 edition of Surveillance magazine.

Please call the MAF exotic Disease and Pest Hotline:

0800 809 966



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