

EquiSal –
Tapeworm
burden
diagnosis
straight from
the horse's
mouth!



EquiSal Tapeworm Test is a revolutionary, simple-to-use horse saliva test for detecting harmful tapeworm infections in horses. For the first time, it meets the need for a user-friendly tapeworm test, where horse owners themselves are able to collect and return samples for testing. A non-invasive saliva collection kit is supplied which is easily posted to the laboratory. Reliable detection of harmful tapeworm burdens enables horse owners to medicate only when needed.



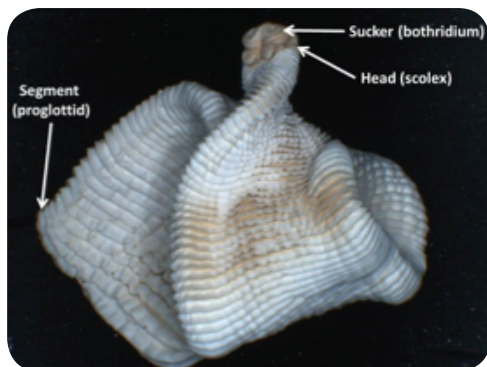
By Austin Davis Biologics Ltd.

www.equisal.com



The problem with tapeworm

Tapeworm burdens pose a significant threat to horse health as they are associated with colic caused by intussusception, caecal perforation or rupture, thickening of the ileo-caecal junction and mucosa, intestinal obstruction, and ileal or caecal torsion. Even without these clinical sequelae, the presence of a tapeworm burden causes local chronic inflammation which can lead to severe lesions in the intestinal wall.



The most common tapeworm in the UK, *Anoplocephala perfoliata*, is flat and can grow to about 8 cm long by 1.5 cm wide. The body consists of numerous segments (proglottids) and the head (scolex) has four suckers (bothridia) which the tapeworm uses to attach itself to the gut wall. They mainly reside at the ileo-caecal junction and adjacent areas of the intestine and caecum.

Infected horses pass tapeworm eggs onto the pasture where they are consumed by the intermediate host, free-living oribatid mites. The eggs develop into larvae within the mite. When the mite is ingested by a grazing horse, the larvae are released within the horse where they develop into adult tapeworms capable of completing the cycle by releasing eggs. The proglottids mature into a sac of eggs (gravid proglottids) which breaks up, releasing the eggs whereupon the cycle begins again.

Worming and detection of tapeworm

A consequence of the tapeworm's egg release mechanism is that burdens cannot be reliably detected by faecal egg counts (FEC). Although tapeworm eggs can sometimes be detected in FECs, the true tapeworm burden can be substantially underestimated as eggs can only be counted if the segments break up and release the eggs uniformly within the faeces.

It has been common practice to "blanket worm" every horse with tapeworm wormer, regardless of whether the horse has a tapeworm burden or not. Frequent use of wormers puts tremendous selection pressure on the worms to adapt to survive this continuous medication onslaught. The result is a relentless, steady emergence of resistance. There are increasing reports of resistance in small redworms (cyathostomes) to various wormer drugs, which serves as a warning for the management of tapeworm burdens.

Widespread resistance in tapeworms would have devastating consequences, especially as there are only two effective drugs (praziquantel and pyrantel embonate) for the control of tapeworm in horses. During our research, only 12% of the horses tested were found to need tapeworm treatment, so current practice obviously results in gross over-treatment.



The EquiSal Tapeworm Test

The innovative EquiSal Tapeworm Test was developed at Austin Davis Biologics Ltd by a team of experienced scientists (one of whom was an inventor of the Clear Blue pregnancy test). The test measures specific anti-tapeworm antibodies in saliva by means of a combination of enzyme-linked immunosorbent assays (ELISAs). Each sample is analysed with integrated tests of the saliva, to account for variations in saliva flow and impacts of diet. Saliva is collected by the horse owner using a unique saliva collection swab. An indicator zone turns pink when the required volume has been collected.

Within the laboratory, saliva samples are handled by a state-of-the-art automated (robotic) liquid handling system to ensure very high accuracy, as well as high-fidelity sample tracking throughout the EquiSal Tapeworm Test procedure.



A complex algorithm is applied to de-convolute data from the integrated ELISA tests to deliver an EquiSal diagnosis of tapeworm burden.

Rigorous statistical analysis and validation of the EquiSal Tapeworm Test has been carried out using saliva samples taken from horses in which the level of tapeworm burden had been identified macroscopically at post mortem. Tapeworm burdens were classified into 3 levels; low having no detectable tapeworm present at the ileo-caecal junction and adjacent areas, moderate having 1-19 tapeworm present, and high having 20+ tapeworm present. During the statistical analysis, the moderate and high burdens were grouped together to form a moderate/high group. Saliva samples from a total of 104 horses were statistically analysed using a number of different methods, including sensitivity and specificity.

The EquiSal Tapeworm Test is capable of identifying horses with a low burden, or a moderate/high burden with a sensitivity (correctly identified positives) of 83% and specificity (correctly identified negatives) of 85%.

A borderline result can also be assigned according to the statistical analysis. Treatment is recommended for both borderline and moderate/high diagnoses. A sensitivity of 83% means that 17% of horses identified with tapeworms at post mortem were misclassified as negative by the test. It's important to emphasise that the "misclassified" 17% had a burden generally considered not to be pathogenic, amounting to no more than 20 tapeworms (in most cases, much less). The evidence shows, therefore, that the EquiSal Tapeworm Test correctly identifies all pathogenic burdens, ensuring that treatment is recommended for all cases where control measures are imperative. The statistical evidence shows that the EquiSal Tapeworm Test has an appreciably higher accuracy than seen with previously reported blood tests for tapeworms.

The take-home message is that, at last, a reliable tapeworm testing service exists that allows horse owners to collect samples themselves. EquiSal Tapeworm Testing can be simply and easily incorporated into targeted worming strategies to determine whether individual horses need treating for tapeworms. Users can be confident that treatment will be recommended when needed. The cost has been kept low to encourage uptake.

An EquiSal Tapeworm test kit costs £17.95

This price includes delivery and return postage, the EquiSal saliva collection kit, sample testing, and the EquiSal Tapeworm Test result. **The test kit is also available at trade prices to SQPs, retailers and veterinary surgeons.**



If you are interested in finding out more detailed information on the EquiSal Tapeworm Test, including trade prices and the scientific validation paper then
visit www.equisal.com
or email enquiries@equisal.com



Registered in England No. 06878611



By Austin Davis Biologics Ltd.

www.equisal.com

