HBLB Thoroughbred Research Consultation Group: an update on recent projects

One of the three central purposes of the Horserace Betting Levy Board (HBLB), as set out in the Betting and Gaming Lotteries Act 1963, is to apply money raised from the levy to "the advancement and encouragement of veterinary science or veterinary education". Over the past 30 years the HBLB has spent £32 million with this aim and in 2019, out of a total spend of £73.8m, the HBLB allocated £2m on this purpose.

The HBLB's research funding supports work aimed at:

- Benefiting the health and well-being of horses, particularly the thoroughbred;
- Minimising the impact and improving the clinical management of disease and injury in all age groups;
- Promoting successful breeding and production;
- Preventing and treating injury in racehorses.

The research funded has made a significant contribution to the health and welfare of both thoroughbreds and the wider horse population. Previous research topics have included epidemiology of racecourse injuries, which has informed improved racecourse design and safety protocols; the science and treatment of tendon injuries; investigations into worming protocols, with the aim of combating the effects of resistance to wormers; and investigations into a number of infectious diseases relevant to the thoroughbred.

As well as funding research, the HBLB has supported long-running surveillance work focused on equine influenza and infectious disease monitoring. This was previously performed at the Animal Health Trust and, since its recent closure, is continuing, with Levy Board funding. The HBLB also supports the production of the Codes of Practice, which informs best practice for a number of equine diseases. This combination of surveillance, testing and education has been critical to preventing and reducing the potentially devastating impact of many diseases, including equine influenza, on the racing industry over the last 20 years.

Each year the Thoroughbred Research Consultation Group meets to review the research work that has been done within the last 12 months and to listen to representatives from the industry to better understand priority areas for funding. A summary of the major projects that finished in 2019 follows:

Clostridium botulinum Type C Vaccination Trial for Grass Sickness

Dr Jo Ireland, University of Liverpool

Grass sickness is a potentially fatal disease (mortality rate >85%) that affects the nervous systems of horses grazing at pasture. The most common clinical signs of the disease are related to a slowing down of the intestines leading to colic.

Horses of all ages can be affected by grass sickness but it is most commonly seen in horses from 2-7 years of age. No specific causal agent has yet been identified however toxins of the Clostridium botulinum bacteria have been suggested. This large scale detailed project investigated whether a vaccine for Clostridium botulinum would be protective against grass sickness.

This was a randomised controlled trial where horses were either given a placebo or the vaccination. In total, 120 premises, 224 horse owners and 85 veterinary practices from across the UK were involved (*Figure 1*).

Though the study recorded a significant difference in the levels of antibodies (part of the immune response) in the blood to Clostridium botulinum after vaccination and a suggestion of some protective effect, due to the low incidence of Equine Grass Sickness during the years of the trial, they were not able to demonstrate a statistically significant protective effect against Equine Grass Sickness. However, valuable data about the safety and effects of using clostridial vaccines in horses was gained and it is expected that the data gathered will inform future research into this disease.

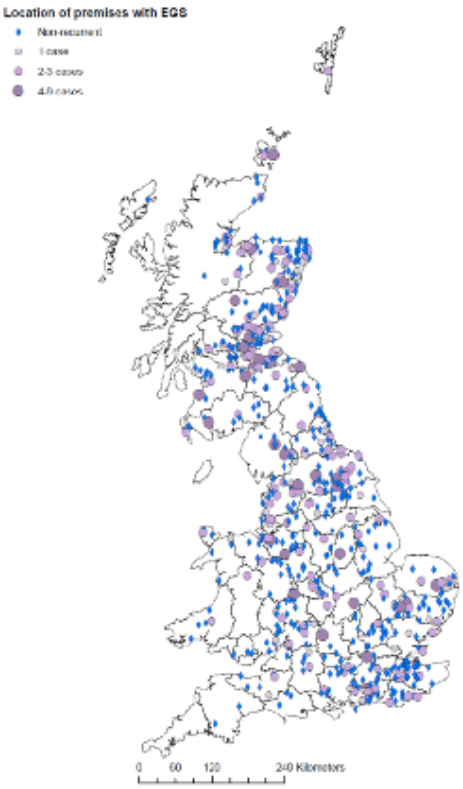

Figure 1 *Map showing locations of EGS cases reported to the nationwide EGS Surveillance Scheme during 2007-2009, reproduced from Wylie et al., Equine Veterinary Journal (2011) 43; 571-579*

Prediction of Antigenic Drift in Equine Influenza Viruses

Dr Debra Elton

With 23 race meetings lost due to an outbreak of equine influenza in 2019, it is clear that research in this area is vital. One of the challenging aspects of dealing with any influenza outbreak is the constantly evolving strains of the virus. The purpose of this highly technical study was to develop methods to help predict new strains and to develop tools to study those changes.

The researchers particularly looked at the expression of haemagglutinin proteins on the surface of equine influenza viruses. Haemagglutinin is one of the proteins that is used to

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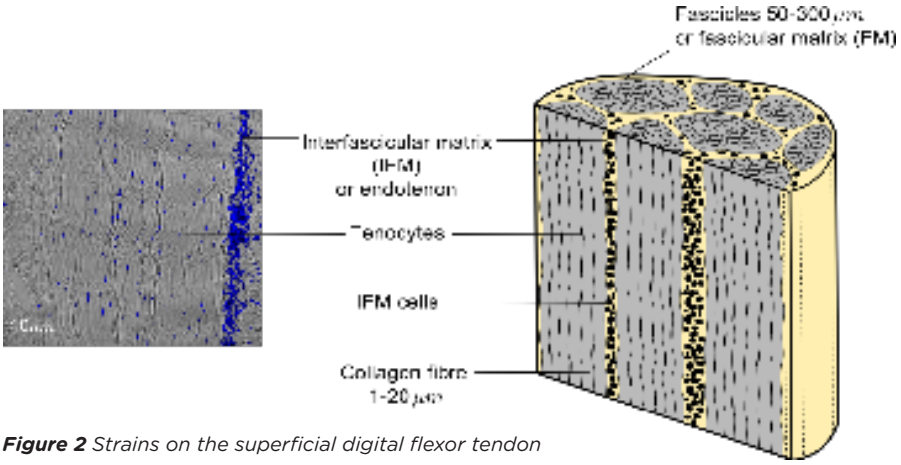

Figure 2 *Strains on the superficial digital flexor tendon*

›› describe different strains of viruses. Last year's outbreak, for example, was H(haemagglutinin)3N8.

The researchers produced a number of viruses that were genetically the same apart from various mutations in the genetics that code for the haemagglutinin, and then characterised the changes in the structure of the haemagglutinins that were expressed on the viruses surface.

The study has created useful tools for the surveillance and research of equine influenza and helped regarding preparedness for dealing with emerging strains of influenza.

Measuring Local Strain Distributions Through the Equine Superficial Digital Flexor Tendon as a Novel Indicator of Injury Risk: Effective Injury Management and Prevention

Professor Hazel Screen, Queen Mary University of London

This major research project investigated the use of ultrasound slip elastography to quantify sliding that occurs between fascicles (structures that make up a tendon) in equine superficial digital flexor tendon injury (*Figure 2*). It was hypothesised that reduced sliding between the fascicles may make horses more injury prone.

The technique was developed for use in people to determine the margins of tumours. A significant amount of work has now been done to adapt the system to study tendon injury in both human and equine athletes.

To date the project has achieved the goal of establishing the hardware and software to enable imaging in the horse. They now plan to use the new clinical imaging tools to assess risk of injury in the field and to assess track- injured horse over time.

Superficial digital flexor tendon (SDFT) injury is a significant cause of retirement from training. Information that could help to better predict injury rates and to assess damaged tissue would hopefully reduce this type of injury and better inform the decision-making during rehabilitation.

More information about the fund and previous projects can be found at https://racehorsehealth.hblb.org.uk/

The fund also sponsored a number of small projects including:

- ATLAS – Automated Thoroughbred Lameness Assessment System at the racetrack or yard (Dr Julien le Kernec, University of Glasgow).
- Comparison of the effects of magnetic field strength and variations in acquisition system on image quality in equine clinical MRI (Professor Lance Voute, University of Glasgow).

The following scholarships were supported:

- **EQUINE ORTHAPAEDICS** Long pastern bone fracture prediction. Giulia Lipreri, University of Liverpool.
- **EQUINE ORTHAPAEDICS** Techniques for detecting pre joint disease conditions. Robyn Graham, University of Edinburgh.
- **EQUINE PATHOLOGY** Veterinary Anatomic pathology: species and prevalence of mycoplasmas in the airways of TB horses. Alejandro Suarez-Bonnet, Royal Veterinary College.