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Equine influenza: Are we protecting our horses effectively?

The protection afforded by equine flu vaccinations is not as straightforward as we might think suggests a special focus on Equine Influenza (EIV) published this month in the *Equine Veterinary Journal* (EVJ). The editorial includes scientific, surveillance, animal health industry and regulatory viewpoints that raise questions over the role of vaccination in both limiting the spread of infection and reducing the severity of clinical signs. The importance of vaccine strain and composition is also discussed. The British Equine Veterinary Association (BEVA) meanwhile is working with key parties to ensure that the UK's horses are protected from EIV in the most effective ways possible.

Equine influenza is a highly contagious viral disease. It is rarely fatal, usually resolving within two to three weeks. It has the potential to be highly disruptive to training and competition schedules. Graeme Cooke, FEI Veterinary Director writing in EVJ points out "protection against influenza depends on good management combined with a good vaccination programme using efficacious vaccine products, with as much of the equine population as possible being vaccinated. Limiting the effect of outbreaks also depends on having good organised surveillance, or at least taking samples quickly to obtain an early diagnosis. Very important for prevention is the routine application in stables of simple biosecurity measures to prevent the introduction of this and other diseases or at least to reduce their onward transmission. Biosecurity should be the first piece of advice that clinicians give to their clients about influenza prevention" [1].

Vaccination against equine influenza has been mandatory for racing Thoroughbreds in the United Kingdom (UK) since 1981, and major outbreaks have been few and far between since then. The aim of vaccination is two-fold: to protect the vaccinated individual from becoming ill and to limit the spread of infection by reducing the amount of virus a vaccinated horse will shed if it does become infected, this latter aim being the more important of the two.

Contrary to the perceived efficacy of robust vaccination protocols and absence of infection and disease, EIV was found in around 15% of nasopharyngeal swabs from both vaccinated

and unvaccinated horses in a recent retrospective analysis of laboratory samples in France [2].

In her state-of-the-art review *What can mathematical models bring to the control of equine influenza?* Dr JM Daly uses key findings from various modelling studies conducted over the past 10 years to illustrate how this technique can be used to help inform decision-making on prevention and outbreak management. The review concludes that the majority of outbreaks in vaccinated groups of horses are of limited size and that vaccination reduces the occurrence of epidemics [3].

The flu virus has an ability to mutate the proteins on its surface, a process known as antigenic drift. These surface proteins are the structures that are recognised by the immune-system and if they change, a vaccine which has been produced to recognise proteins on older virus strains will be less effective. However, the World Organisation for Animal Health (OIE) is using continual analysis of field surveillance data to recommend suitable vaccine strains for inclusion in commercial vaccines in order to help prevent this problem. This work is supported in the UK by the Equine Influenza Programme (www.equiflunet.org.uk/), which is backed by the racing industry via the Horserace Betting Levy Board (<http://racehorsehealth.hblb.org.uk/>) [4]. None of the vaccines currently on sale in UK have the most recently recommended strains and only one in the US achieves this [5].

However, Loïc J. Legrand's recent study *Surveillance of equine influenza viruses through the RESPE network in France from November 2005 to October 2010* concludes that vaccination is not the whole answer to the prevention of EIV outbreaks. He is one of many to have diagnosed flu in horses that were vaccinated as well as those that were not [2], which is a likely result of the use of mismatched vaccine strains. Although of little consequence for individuals, mismatched vaccine strains increase the likelihood of large outbreaks and played a role in the escape of the virus from the quarantine station in Australia, which seeded the major epidemic there. However Dr Horspool, in her article *Equine influenza vaccines in Europe – a view from the animal health industry*, makes the important point that this is not the only factor influencing the effectiveness of any specific product and that although some vaccinated horses develop signs and shed virus when exposed to natural challenge with EIV, to date there have been no major flu outbreaks in vaccinated populations [6]. Dr Woodland from the Veterinary Medicines Directorate also highlights that an important aim for the licensing authorities is to ensure that vaccines we use in our horses are safe as well as effective. The process of developing a vaccine strain for inclusion in an authorised vaccine may take several years. A degree of cross protection between flu strains can be expected and, in contrast to most human influenza vaccines, most equine influenza vaccines contain adjuvants which help boost the immune response and increase the effectiveness [7].

Professor Celia Marr, Editor of *Equine Veterinary Journal* said: “The EIV disaster in Australia in 2007 was an important wake-up call, yet many racing authorities still have no requirement for vaccination. On-going surveillance and a better route to updating vaccine strains are key, while compliance with sport regulators’ requirements is a powerful motivator to ensure vaccination takes place.”

Professor Marr continued: “The British horseracing industry is to be commended as they fund a major surveillance programme via the HBLB but it would be good to see this effort translated into new products. It is important that horse owners realise that vaccinating their horses simply to comply with Sports regulators requirement may not actually achieve the frequency recommended by the manufacturers, particularly at the beginning of the course. The manufacturers recommendations must be followed if the vaccine is to be effective.”

The British Equine Veterinary Association (BEVA) is currently working with representatives of the animal health industry, the Veterinary Medicines Directorate, the Fédération Equestre International, British Horseracing Authority and scientists involved in influenza surveillance. The working party aims to establish revised guidelines to facilitate and reduce costs of approvals for vaccine strain updates, encourage further education and surveillance on EIV and to review FEI and BHA rules to ensure vaccine use is in accordance with manufacturer’s data sheet.

David Mountford, CEO of BEVA commented “In order to drive the development of new vaccine strains there needs to be collaboration between all stakeholders based on the risk to the equine industry, the understanding of individual disease outcomes (i.e. clinical disease and virus shedding), and the demand from Sporting Authorities, Veterinary practitioners and horse owners. These factors, alongside proposed simplification of regulatory requirements, will generate the commercial environment that will effect change.”

1. Cooke, G, Vaccination for equine influenza: The sports regulator's viewpoint, *Equine Veterinary Journal*, DOI: 10.1111/evj.12151
2. Legrand, LJ and others, Surveillance of equine influenza viruses through the RESPE network in France from November 2005 to October 2010, *Equine Veterinary Journal* DOI: 10.1111/evj.12100
3. Daly, JM and others, What can mathematical models bring to the control of equine influenza? *Equine Veterinary Journal*, DOI: 10.1111/evj.12104
4. Elton D, Cullinane A. Equine influenza: Antigenic drift and implications for vaccines, *Equine Veterinary Journal* DOI: 10.1111/evj.12148
5. Marr, CM, Sellon, D. Mountford, D. Influenza: are we protecting our horses effectively? *Equine Veterinary Journal*, DOI: 10.1111/evj.12172
6. Horspool LJI, King, A. Equine influenza vaccines in Europe: A view from the animal health industry. *Equine Veterinary Journal*, DOI: 10.1111/evj.12171

7. Woodland, RM, Influenza vaccine strains: Licensing perspectives. *Equine Veterinary Journal*, DOI: 10.1111/evj.12155

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Notes to editors

- EVJ is an unrivalled international equine veterinary science journal owned by the British Equine Veterinary Association and is published by Wiley-Blackwell. The journal strives to publish clinically orientated research and was first published in 1968. It now appears bi-monthly with around 128 pages per issue.
- The EVJ special focus on equine influenza can be accessed at: <http://onlinelibrary.wiley.com/doi/10.1111/evj.2013.45.issue-6/issuetoc>
- Further information from: David Mountford, British Equine Veterinary Association, telephone 01638 723 555, email: david@beva.org.uk.