

## **EQUINE INFLUENZA: A CONTINUING THREAT TO INTERNATIONAL RACING**

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Horse travel internationally for trade, competition and breeding purposes with minimal quarantine restrictions. Air transportation allows global movement of infected animals within short periods of time. Major outbreaks of equine influenza have occurred in South Africa, India, Hong Kong and the Philippines as a result of introduction of infected horses from countries where the disease is endemic. Inadequate vaccines can afford clinical protection, while allowing virus shedding and sub-clinically infected animals are key to the epidemiology of the disease. Equine influenza is endemic in the Americas, Europe and Asia with outbreaks occurring annually. However, clinical signs may be mild and the infection often goes unrecognised during inter-epidemic periods, particularly in areas where there is no active surveillance. Viruses continue to evolve and vaccine strains become outdated. The A/equine 1 virus subtype has not been isolated for over 20 years, but 2 major lineages (American and European) of the A/equine 2 subtype continue to circulate. Antigenic drift is being monitored in these viruses and there is concern that continued changes will lead to new epidemics.

Studies in North America have demonstrated that classical inactivated whole virus vaccines are of variable and poor potency and do not provide more than transient protection. Further, naïve animals require 3–4 doses before protective levels of antibody are first acquired. New approaches to vaccination are therefore required. The efficacy of a live attenuated intranasal vaccine (Fluavert), has been assessed by challenge infections for up to 12 months after a single dose and a new inactivated product (Calvenza), which contains representative strains of the American and European lineages of the H3N8 virus, induces durable antibody and good protection for one year. Additionally, in Europe, a recombinant canarypox vectored vaccine is now available which contains

representative strains of both H3N8 lineages. Rapid and durable immunity have been demonstrated in challenge studies.

In spring 2003, equine influenza virus caused widespread disease in Newmarket, in the UK. The source of infection is not clear, although antigenic analyses indicated that similar viruses were concurrently causing respiratory disease among non-Thoroughbred horses in several geographically diverse locations. In Newmarket, over 1,300 well-vaccinated racehorses were infected. Vaccine failure has previously been ascribed to poor vaccine potency or to antigenic drift of the virus. However, antibody measured in acute sera from the outbreak indicated a protective level. Further, antigenic and genetic characterisation suggested that, according to current criteria, the American lineage component of the vaccine should protect against infection with the outbreak strain. Other factors such as viral virulence and transmissibility are therefore being considered. Nasal swabs and serum taken following challenge of naïve ponies demonstrated unusually high levels of cytokines and it is proposed that the pathogenicity of the outbreak strain influenced its ability to cause a more widespread outbreak than other strains.

In December 2003 equine influenza was re-introduced to South Africa. Regrettably, vaccination was no longer mandatory for competition horses and the infection became widespread. The South African virus, like the Newmarket isolate, belonged to a sublineage of the American viruses which were originally identified in South America.

The role of the international equine influenza surveillance programme and the importance of harmonisation of vaccine standards, virus strains and vaccination policies will be discussed in the context of international control of this disease which can seriously disrupt racing.