National Management Group: Equine Influenza

COMMUNIQUE

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Equine Influenza Response Remains on Track

The National Management Group (NMG) addressing the Equine Influenza outbreak has re-affirmed its view that equine influenza can be contained with a view to eradication, with current control measures remaining effective.

The group has asked its scientific and technical advisory body, the Consultative Committee on Emergency Animal Disease (CCEAD), to develop scenarios to project the future trend of the outbreak based on reasonable assumptions.

This work should help response agencies, industry and recreational horse owners develop a clearer picture of how much longer stringent biosecurity and movement restrictions may need to be maintained.

The NMG has also issued a paper on vaccination *Equine Influenza Vaccination in a Containment and Eradication Situation* to help inform stakeholders and the public debate on the issue. Prepared by the CCEAD, the paper outlines technical facts about vaccination and key issues for considering vaccination as a control measure.

Contingency planning for the possible future use of vaccines is being undertaken. CCEAD will prepare a risk analysis on key issues, focussing on possible triggers for vaccination use and strategies for employing it.

Meanwhile, the need for maintaining current standstill requirements and biosecurity measures will be reinforced through an advertising and direct mail campaign targeting peri-urban landholders.

The campaign will highlight the importance of the standstill measures in force in NSW, Queensland and the ACT, and critical biosecurity measures including personal hygiene around horses, limiting access to animals, keeping watch for signs of the disease, and reporting suspected cases.

NMG is comprised of the Chief Executive Officers of the Commonwealth and State/Territory departments of agriculture/primary industries across Australia, and also the heads of the peak bodies representing the horse industry.

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Equine Influenza Vaccination in a Containment and Eradication Situation

Introduction

This paper outlines the range of issues that need to be weighed in considering the use of vaccination in Australia's response to the current equine influenza (EI) outbreak. There are strong arguments for as well as against the use of vaccination as part of Australia's current equine influenza eradication program (see summary in Table 1). A benefit-cost-analysis is currently being developed.

Whilst vaccination might assist in particular circumstances, it cannot offer a quick fix solution in a national program. However, as a precaution, contingency planning for possible future use of vaccines in particular situations is being undertaken.

EI is due to infection with H3 or H7 influenza A viruses. The current outbreak in Australia is due to an H3 virus. Although all H3 viruses that infect horses are of the subtype H3N8, they are not all the same. They are subject to the same evolutionary process as all influenza A viruses: they are continually changing, a process called antigenic drift. This is why animals can catch influenza more than once, even in consecutive years, and why influenza vaccines (in humans) are changed annually in accordance with predicted antigenic requirements.

EI is endemic in virtually all countries with significant equine industries, and vaccination is used to control the disease in those countries. Australia (until recently) and New Zealand are the only countries with large equine populations free of the disease and therefore do not vaccinate.

Although vaccination can prevent disease, the available EI vaccines neither fully prevent infection nor transmission of virus. However, vaccinated horses, in response to EI infection, shed less virus for shorter periods and show fewer or no detectable clinical signs than fully susceptible horses.

Better protection will result when there is a close relationship between the field virus and the strain used in a vaccine.

Immunity following vaccination is much shorter than that induced by natural infection. Sporadic outbreaks of disease still occur in countries where vaccination is practised as a result of inadequate vaccine coverage or if new strains emerge or are introduced.

Vaccination considerations

For a country like Australia, the decision to use vaccination or not is complex, and there are many issues that need to be considered. Unlike endemically infected countries, EI has been only recently introduced into Australia and presently affects only part of the country and specific sectors of the horse industry (predominantly the recreational sector).

Vaccination will not produce protective immunity until about two weeks after the primary course is completed. All available vaccines recommend a primary course of two vaccinations, generally 4 to 6 weeks apart. This means that immunity will not be optimal until about six weeks after a horse is first vaccinated.

Types of vaccines

There are three types of EI vaccines commercially available:

- Inactivated ('killed') vaccines
- Live attenuated vaccines
- Recombinant canary pox vectored vaccine

For inactivated vaccines, a primary course consisting of two vaccinations 4-6 weeks apart is required before vaccine-based immunity is effective. Optimal immunity is not present until at least 7-14 days after the second dose. For ongoing protection from disease, manufacturers recommend a booster vaccination 6 months after the primary course and then annually.

Live attenuated vaccines and recombinant vaccines, while still not providing complete protection, produce quicker and stronger immunity than inactivated vaccines. Live attenuated vaccines are not being considered for use in Australia because of the potential for introduction of other strains of EI virus. The recombinant vaccine is under consideration in Australia; it is the preferred choice as it has been shown that this vaccine can provide protection and reduce shedding of virus 14 days after a single dose. A second booster vaccination is required to ensure adequate duration of immunity. This vaccine was used successfully during the 2003 EI outbreak in South Africa.

Procedures

Vaccinators must maintain stringent hygiene procedures to avoid spreading EI between properties. A cold chain would be required for the storage of vaccine. Vaccine use under emergency permits may require stringent administrative control of vaccine issue and use.

Brood mares can be vaccinated during pregnancy and lactation (in accordance with manufacturers' recommendations), but vaccination in the month before foaling will not allow time for adequate production of antibody in colostrum, resulting in poor passive antibody protection of newborn foals. In countries where EI is endemic, vaccination of broodmares is used to ensure maternal antibody to EI in colostrum, providing passive immunity for newborn foals.

There is no evidence that vaccination of horses already incubating influenza is harmful, but vaccination of clinically ill horses is not recommended. Some manufacturers recommend against vaccinating young foals because in endemic countries the presence of colostral antibodies will interfere with development of immunity. This would not be a concern in the current Australian situation; advice from equine experts at the Animal Health Trust in the UK is that vaccinating young foals in naïve populations is likely to reduce clinical impact if these were to be exposed to infection.

Australian policy

Australia's response to a range of emergency animal diseases is captured in a series of technical and scientific response manuals called AUSVETPLAN. In terms of EI, AUSVETPLAN states that vaccination will not be used if an EI outbreak is detected early and can be confidently contained by effective movement controls[1]. However, AUSVETPLAN recognises that vaccination may be appropriate where:

- the disease is widespread when detected; or,
- significant numbers of horses are at immediate risk; or,
- initial controls methods have failed, and the disease has spread beyond the original restricted area and is likely to become endemic in the general equine population.

AUSVETPLAN identifies the following strategies for the use of vaccination in the face of an outbreak:

- *mass vaccination* – this would involve widespread vaccination of horses to build up herd immunity
- *ring vaccination* – vaccination is carried out locally in a ring around identified sources of infection to limit further spread by producing an immune buffer
- *predictive vaccination* – this targets enterprises and populations that could be expected to contribute most to future spatial transmission of infection

Vaccination strategies

Vaccination has not, on its own, resulted in EI eradication anywhere in the world, and the use of stringent biosecurity measures and movement controls would still be required. Therefore it must be implemented in conjunction with identification, record keeping, quarantine and movement control measures [2]

Vaccination may be used to protect animals in important sub sectors/regions of the horse industry and/or to reduce the economic impact of the current approach on these sub sectors/regions and the wider economy.

Vaccination may be used to reduce the impact of disease on horses required to move for competition and other reasons e.g. breeding. Horses would be required to be vaccinated before movement, and because vaccinated horses can still become infected, stringent quarantine and movement controls would be necessary between infected and uninfected zones.

In practice, these measures (as mentioned in the paragraphs above) need to be elaborated to a much more detailed level, before being considered for implementation.

[1] Here containment refers to infection being restricted geographically with, eradication considered to be feasible

[2] A National Horse Identification Document approved by the International Equestrian Federation (FEI) has provision for vaccination records. This document is easily convertible into an FEI Horse Passport valid for international travel. EFA branches in all states could process registrations.

Table: Advantages and disadvantages of vaccination for EI

Advantages
• Vaccination can prevent clinical disease. • Vaccination reduces the susceptibility of at-risk horses, reduces the severity of clinical signs and the level of viral shedding if they become infected. • Vaccination can reduce farm-to-farm spread of infection. • Apart from horse movements to New Zealand, there are unlikely to be any international implications of vaccinating.
Disadvantages
• Vaccination may mask clinical signs so vaccinated horses will need to be identified and monitored for evidence of infection. • Serological monitoring will be difficult, even though tests are available to differentiate vaccinated horses. Some tests used in this respect may not be internationally validated. • The movement of sub-clinically infected vaccinated horses may spread infection to previously unaffected areas. • Vaccination may prolong the need for movement restrictions because it may slow the transmission and spread of infection within areas. • Vaccinating selected regions will lead to the country being separated into free and vaccinated areas. This will result in differential movement requirements and the need for infrastructure (permits, border controls, etc) to maintain integrity of free areas. • Vaccination will have an impact in terms of registration and passport issues and the practical control measures required before many horse events can proceed. • Vaccination is not an immediate option, it will take time to import vaccine (permit process), deploy vaccine and train vaccinators, vaccinate the population and for immunity to develop. • In the case of the recombinant vaccine there may be restrictions placed on how and who may use the vaccine. • Vaccination may affect performance in the short term. • Vaccine use is likely to extend the duration of the outbreak and delay ability to declare freedom.