

EQUINE INFLUENZA VACCINES AND THE IMPLICATIONS OF THEIR USE IN NEW ZEALAND

The recent news that Australia has begun the controlled use of equine influenza (EI) vaccine in infected areas has resulted in increasing calls from a number of quarters for vaccination of horses in New Zealand. The use and timing of vaccination in an EI outbreak is always a controversial issue. A decision to vaccinate, especially in situations where the disease is not present, is not a simple matter and many factors require consideration. The impacts and consequences of vaccination will also affect different sectors of the horse industry in different ways, and it is important that all views from potentially affected parties are considered before any decisions are made. To be able to make an informed decision it is important that all the facts around the vaccine be considered.



Vaccine types

There are three types of EI vaccines available:

Killed or inactivated vaccines – the vaccine contains virus that is killed (usually by chemicals). These vaccines frequently include a number of strains of the EI virus. The main advantage of these vaccines is their safety. They are administered by injection and usually require two injections four to six weeks apart. Vaccinated animals usually only become fully immune 7–14 days after the second dose. For ongoing protection from disease a booster vaccination is given at six months, and thereafter yearly or more frequently, depending on the likely exposure of the horse to EI.

Live modified vaccines – these vaccines have been made relatively safe through a process whereby the virulence of the virus is weakened. Because a live virus is used they do present the risk of viral spread. Vaccine is usually administered via the nose of the animal. These vaccines must not be used in pregnant mares. A single dose is followed by boosters at six monthly intervals. There is evidence of early protection (as early as seven days) following vaccination, though full immunity is claimed to occur later than this.

Modified vaccines – another form of “live vaccine” they include genetically modified virus material and are treated as a separate type of vaccine. The virus, because it has been modified, is not able to spread from horse to horse. The vaccine is given by injection with two initial doses given four to six weeks apart, followed by boosters at six month intervals. Immunity has been documented at 14 days after administration of the first dose.

Which vaccine to use?

Like the human flu virus, the EI virus is constantly changing and this is the reason why horses can catch influenza more than once, or become infected even if they are vaccinated.

The different types of vaccine are named after the place where the disease was confirmed – you will see reference to names like Newmarket, Florida, Prague etc. Although vaccination may prevent disease, EI vaccines neither fully prevent infection nor transmission of the virus.

It is important to use the correct vaccine for the type of influenza virus you want to protect against (i.e. that the vaccine contains the correct virus types). Vaccine manufacturers are constantly updating their vaccines in response to new subtypes. When there is a new outbreak it is important to know the virus type you are dealing with, to be able to select the most appropriate vaccine. Most influenza vaccines have at least two subtypes and generally include American and European strains. Correctly vaccinated horses shed less virus for shorter periods and show fewer or no detectable clinical signs than horses that have not been vaccinated.

Immunity is short lived and costly

The immunity in horses after vaccination is relatively short lived and therefore revaccination is important. It is generally accepted that for vaccination to have much impact on EI it is necessary to have a strict vaccination programme that includes about 70% of the horse population. If we were to apply this to New Zealand with approximately 120,000 horses, we would need to vaccinate 84,000 horses. At a cost of approximately \$375 + GST for an initial three dose course of killed vaccine per horse the first year cost would be about \$30 million.

If a vaccination programme is not maintained the population may become increasingly susceptible to EI again. This is one of the reasons why in countries where vaccination is practised there are still outbreaks of the diseases.

Vaccinated horses can spread the disease

Vaccinated horses may still become infected but will show few or no clinical signs because they have some protection. Horses that have had EI or that have been exposed to the virus (even if vaccinated) can carry and shed the virus for up to 14 days and infect other animals. Therefore the disease can be spread as horses that are not obviously ill are moved from place to place. This is often how the disease enters a country – in horses with immunity that are carrying the virus. Vaccination also makes confirming the presence of EI more difficult and more expensive.

Why use vaccine in an outbreak?

If used correctly in an outbreak vaccines can slow the spread of the disease and reduce or minimise the effects in horses. However, it is important that the use of vaccines is strictly controlled, so that it is known which horses have been vaccinated and when they were vaccinated, to ensure that vaccinated horses do not unwittingly spread the disease further.

Registered vaccines

MAF Biosecurity New Zealand (MAFBNZ) currently has two vaccines registered (both inactivated vaccines) for emergency use in the event of an EI outbreak in New Zealand. The vaccines are registered to enable MAFBNZ to quickly source stocks from overseas. No stocks of vaccine are actually held in New Zealand. In an outbreak the plan is to be able to vaccinate unaffected horses away from an infected area to create a “buffer zone” while movement controls are put in place and eradication attempted. However, as inactivated vaccines may take quite a long time to produce immunity in horses other vaccines are also being considered.

Vaccination in non-emergency situations

Since Australia decided to vaccinate against EI the issue of why New Zealand should or should not vaccinate has caused a lot of debate.

There are several reasons why the vaccine is strictly controlled and why using it preventatively in the absence of disease needs to be very carefully considered.

Possible uses for the vaccine in the absence of EI in New Zealand could include:

- **targeted** vaccination of high risk populations within New Zealand e.g. horses that travel frequently out of New Zealand, or
- **pre-emptive** vaccination of the country's horse population to reduce the impact of disease and to reduce the likelihood of spread should it enter New Zealand.

If pre-emptive vaccination is used in New Zealand at least 70% of the horse population needs to be immune, so that the disease does not spread. If lower percentages of horses are vaccinated then this may not prevent outbreaks from occurring. And even with high vaccination rates there is no guarantee of protection, as other strains may emerge that horses are not immune to and still result in outbreaks.

Implications of using vaccination before the disease occurs

Impact on EI free status for international trade

One of MAFBNZ's main concerns around vaccination on a large scale in the absence of disease (i.e. non-emergency use) is the potential impact on our EI free status.

If a significant number of horses were vaccinated then MAFBNZ could no longer rely upon detecting clinical signs in infected animals, as we currently do, to ensure that New Zealand retains its EI free status. This could affect exports to other nations. New Zealand would still claim freedom but this would be treated with less credence by trading partners who are under no obligation to accept our claims of freedom at face value.

The International Organisation for Animal Health (OIE) has specific guidelines for EI free countries where vaccination is used. To comply with their requirements New Zealand's equine industry would need to undertake an extensive and expensive surveillance programme, to ensure that our claims of EI freedom are accepted by other countries. This also means that to retain EI free status, New Zealand would need to identify horses that have been vaccinated, which is why all horses that are vaccinated in Australia have to be micro-chipped. If maintaining our EI free status is not considered important then these measures and associated costs may be avoided.

"Silent spread"

Vaccination may hide signs of infection in horses but still allow horses to spread the virus. This will result in so-called "silent spread" of the disease. This would allow the disease to spread much more rapidly before it could be detected. By the time it shows up in a non-vaccinated horse it could potentially be very widespread.

Need for repeated, regular, vaccination

Horses need to be vaccinated at regular intervals to ensure that a solid immunity is built up and maintained. If vaccination is allowed to lapse (and this is a real risk where people don't see evidence of disease after a period of time and then decide not to revaccinate) it results in a horse population that is again at risk.