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The global horse community has long recognized the necessity of vaccinating against equine influenza (EI). However, immunization protocols are not universal: There is no recognized standard regarding intervals between EI vaccinations.

In an effort to lay scientific groundwork for establishing an international norm, Virology Unit researchers at the Irish Equine Centre in Johnstown, Ireland, evaluated the efficacy of three vaccination schedules: the minimum duration between doses allowed by the Turf Club, Ireland's Thoroughbred racing authority; the manufacturer's recommended vaccination schedule; and the maximum permissible dosage intervals according to Irish racing rules.

"Outbreaks of equine influenza can lead to the cancellation of equestrian events and cause severe disruption to the horse industry," said Ann Cullinane, MVB, PhD, MRCVS, head of the Virology Unit. "Vaccination is crucial to the control of influenza, and decades of implementation of mandatory vaccination in selected populations has proved to be highly effective.

"However, there is often a lack of harmonization between the mandatory vaccination regimes and the vaccine manufacturers' instructions," she explained. "Prior to this, there was some concern that vaccination in accordance with the racing regulations but not in accordance with the vaccine manufacturers' data sheets might leave racehorses susceptible to influenza. It was accepted that the regulations were based on practicality and flexibility rather than science."

In a randomized clinical trial, the researchers separated 55 unvaccinated, seronegative (showing no detectable EI antibodies) horses into three groups, with each group receiving deep intramuscular injections with a commercially-available immune-stimulating complex EI vaccine at the following intervals:

- Group 1 (in adherence with the minimal vaccination interval permissible by Irish racing authorities): Doses 1 and 2 three weeks apart, followed by Dose 3 five months later;
- Group 2 (in adherence with the vaccine manufacturer's recommended immunization schedule): Doses 1 and 2 six weeks apart, followed by Dose 3 five months later; and
- Group 3 (in adherence with the maximum vaccination interval permissible by Irish racing authorities): Doses 1 and 2 thirteen weeks apart, followed by Dose 3 seven months later.

The team measured antibodies in whole blood samples from all horses at each vaccination, as well as three to five weeks post-vaccination.

Their findings showed:

- The group vaccinated at the longest intervals showed a greater likelihood for gaps in immunity between both the first and second doses and the second and third doses than the groups vaccinated at minimum intervals or according to the manufacturer's recommendations;
- Horses vaccinated at intervals shorter than the manufacturer's recommendations showed no adverse effects. In addition, this group's antibody levels did not decline between the first and second doses, unlike the two groups with longer vaccination intervals;
- Response to second and third doses remained same between the three groups; and
- Some horses of all ages, but particularly yearlings, demonstrated low antibody response to the first vaccine dose.

"We demonstrated that although lengthening the intervals increases the periods when horses are susceptible to flu, it doesn't inhibit the response to subsequent vaccination," Cullinane explained. "Thus, the regulations do not afford maximum protection all the time, but they allow owners and trainers flexibility to choose the time of vaccination to correlate with periods of risk. For example, a horse owner might decide that their horses are more at risk when they first enter the trainer's yard than they are in the preparatory phase at home, and choose to delay booster vaccination until two weeks before they leave to go into training.

Cullinane said this research is important because scientists have recently questioned the scientific validity of revaccinating companion animals, such as dogs and cats, annually. If equine researchers can determine when in a horse's vaccination career it's most beneficial to administer an influenza vaccine at six monthly intervals and when annual (or less-frequent) boosters will suffice, they can help ensure horses develop protection early in life and sustain that protection for as long as possible without overvaccination, she concluded.

This study, "Comparison of primary vaccination regimes for equine influenza: Working towards an evidence-based regime," was published in *Equine Veterinary Journal*.