

# Flu Avert<sup>®</sup> I.N. vaccine

## One Powerful Dose of Immunity

Exceptional protection for flu and beyond

### New study confirms Flu Avert<sup>®</sup> I.N. delivers one-of-a-kind, broad-spectrum protection

An *in vitro* study conducted at Colorado State University<sup>1</sup> demonstrates how the modified influenza virus in Flu Avert I.N. stimulates innate, protective immune responses in the equine upper respiratory tract (URT) similar to wild-type influenza.

These innate immune responses can provide enhanced antigen-specific protection against equine influenza virus (EIV), as well as non-antigen specific mucosal protection that may help protect horses against other equine respiratory pathogens that enter via the URT.



### ONLY Flu Avert I.N.:

- Stimulates similar innate immune responses in equine airway epithelium as seen after infection with wild-type influenza virus.
- Provides unparalleled EIV protection by stimulating local and systemic immunity.
- Escalates mucosal immunity that is antigen (EIV) and non-antigen-specific and which should improve the horse's defense against entry of other common respiratory pathogens, in addition to influenza.

### Flu Avert I.N.

Unique intranasal administration of a cold-adapted MLV influenza strain (not a killed vaccine)



### Respiratory Epithelial Cells

↓  
Triggers

#### Innate Immune Responses

- Cytokines, chemokines
- Antigen (Ag) presentation
- Specific anti-flu protection & non-specific mucosal immunity

#### Adaptive Immune Responses

- Present Ag to dendritic cells & lymphocytes
- (+) B-lymphocytes > anti-flu IgG
- (+) T-lymphocytes

### Innate vs. Adaptive Immune System

#### Innate Immunity

Fast-acting, non-specific immune response that occurs at the site of infection and is always present and readily activated.

#### Adaptive Immunity

Antigen-specific, acquired immunity. Occurs after initial exposure to a specific pathogen. The two types of adaptive immune responses are humoral immunity (antibodies) and cell-mediated immunity.

# The Flu **Avert** Difference

As a modified-live (MLV), intranasal, replicating vaccine, Flu **Avert** I.N. is less subject to the consequences of antigenic drift and continues to provide exceptional protection against clinically relevant influenza strains infecting horses in the U.S.<sup>2,3,4</sup>



## Just **ONE** dose required

- For primary immunization
- For booster immunization following any other EIV vaccine



## Proven safe and effective

- Even in horses immunosuppressed by long distance transport or exercise<sup>5</sup>
- Unprecedented efficacy proven in numerous challenge studies<sup>2,5,6,7</sup>



## Intranasal route of administration

- No muscle soreness or injection-site reaction
- Immunity at the site of infection
- No adjuvant



## Rapid onset of immunity

- Five to seven days in naïve horses<sup>7</sup>
- Recommended for use during EIV outbreaks (AAEP Vaccination Guidelines: [www.aaep.org](http://www.aaep.org))

*"Two fillies racing for a partnership were vaccinated with Flu Avert. Despite the rigors of training, racing and travel, they remained free of respiratory disease all year. This culminated in winning the Sire Stakes Final and Breeders Championship events. Staying healthy was remarkable because EIV was rampant on the racing circuit. Flu Avert is the gold standard for protection against EIV."*

**Robert Schwartz, D.V.M. - Washington Courthouse, Ohio**

*"I send approximately 250-300 yearlings annually to major sales. They are stressed during sales prep and exposed to a lot of other young horses in a similar situation. In six years, I have not had a breakthrough with Flu Avert. It is great for young horses in stressful situations and offers the best protection especially with the mucosal contact during administration."*

**Courtney Pink, D.V.M. - Hanover, Pennsylvania**

<sup>1</sup>HL Pecoraro, D. Koch, G Soboll, Hussey, L Bentsen, GA Landolt. Comparison of innate immune responses in equine respiratory epithelial cells to modified-live equine influenza vaccine and related wild-type influenza virus. Proceedings ACVIM Annual Forum 2014.

<sup>2</sup>Chambers TM, Holland RE, et. al. A new modified live equine influenza virus vaccine: phenotypic stability, restricted spread and efficacy against heterologous virus challenge. Equine Vet J. 2001;33(7):630-636.

<sup>3</sup>Van de Zande S. Efficacy of Flu **Avert** IN, a modified live influenza vaccine for horses used in different vaccination schedules against A/Equi-2/South Africa 04/03 Challenge. Efficacy of Flu **Avert** / Prequenza, a combined vaccination schedule against A/Equi-2/Newmarket/05/03 challenge. Unpublished data.

<sup>4</sup>UC Davis (Nicola Pusterla) & Merck Animal Health. Infectious Upper Respiratory Disease Surveillance Program. Ongoing Research 2008 - present.

<sup>5</sup>Lunn DP, Steve Hussey S, et al. Safety, efficacy, and immunogenicity of a modified-live equine influenza virus vaccine in ponies after induction of exercise-induced immunosuppression. JAVMA 2001;218(6):900-906.

<sup>6</sup>Townsend HGG, Penner SJ, et al. Efficacy of a cold-adapted, intranasal, equine influenza vaccine: challenge trials. Equine Vet J. 2001;33(7)637-643.

<sup>7</sup>Townsend HGG. Onset of protection against live-virus equine influenza challenge following vaccination of naïve horses with a modified-live vaccine. Unpublished data.

The Science of  
Healthier Animals

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