

EHD V2 & V6 EXPERIMENTAL VACCINE

Medgene has been generating data for the EHD vaccine since 2016. Initially, the experimental EHD V2 vaccine was generated during the period covering late 2015 through early 2016, and was available for evaluation in July of 2016. In 2020, Medgene received USDA approval to provide the experimental EHD V2 & V6 vaccine. Users of the vaccine were asked to collect data in regards to safety and clinical impression of the vaccine. Results were submitted to the USDA in December. In March 2022, the USDA approved continued use of the experimental EHD V2 & V6 vaccine through 2022.

Results from Experimental EHD Vaccine Use

Prior to 2016, data was obtained in white-tailed deer 6 months of age or older and shared with the industry at conferences and through magazine articles. In 2020, Medgene worked with a Missouri veterinarian to evaluate the EHD V2 & V6 vaccine in young fawns.

The vaccine was administered to ten (10) 2-3 week old fawns. Blood serum was collected pre (Day 0) and post (Day 35 and Day 63) vaccination to monitor the immune response. A plaque reduction neutralization assay was performed to determine the neutralizing antibody titer of each fawn to both EHD V2 and EHD V6 at varying time points. Table 1 illustrates the results. A titer greater than 10 indicates that antibodies are present that neutralize the virus. The presence of antibodies provides evidence that the animal generated the intended immune response to the vaccine.

Table 1. EHD V2 & V6 Vaccine Immune Response Generated in Young Fawns

Tag #	EHDV2 Neutralizing Antibody Titer			EHDV6 Neutralizing Antibody Titer		
	13Jun20	04Jul20	01Aug20	13Jun20	04Jul20	01Aug20
W8	20	40	80	<10	40	40
W9	<10	40	40	<10	40	40
W10	20	≥ 320	160	<10	40	80
W11	<10	≥ 320	80	<10	80	80
W12	<10	≥ 320	≥ 320	<10	40	40
W13	<10	160	80	<10	40	80
W14	80	≥ 320	≥ 320	<10	80	160
W15	40	≥ 320	≥ 320	<10	40	80
W16	20	80	10	<10	80	20
W17	<10	80	20	<10	80	10
W18 (Control)	<10	<10	<10	<10	<10	<10

*Vaccination dates: 13Jun2020, 04Jul2020

To further our understanding of the serological response to booster vaccination, the Missouri fawns continued to be evaluated throughout 2021. To review, in 2020, the farm vaccinated 10, 2-3 week old fawns. In 2021, they revaccinated those same animals (10 months old when 2021 booster 1 given, 13 months old when 2021 booster 2 given) and Medgene monitored antibody response. Table 2 summarizes EHDV2 antibody titers after booster vaccination.

The data indicates that booster vaccination is critical for increasing the level of neutralizing antibodies to the target disease.

Medgene continues to work with this Missouri farm and these animals to determine the optimal booster schedule. Our current recommendation after the first two initial doses are administered is to booster every six months or twice each spring. The goal is to ensure a high antibody level when EHD season arrives.

Table 2. EHD V2 Vaccine Immune Response Generated in Young Fawns

Tag #	EHDV2 Neutralizing Antibody Titer						
	17Apr21	15May21	14Jun21	10Jul21	07Aug21	04Sep21	02Oct21
W8	160	<10	160	160	≥ 320	≥ 320	80
W9	<10	40	160	≥ 320	≥ 320	≥ 320	≥ 320
W10	80	160	≥ 320	≥ 320	≥ 320	≥ 320	≥ 320
W11	20	80	≥ 320	≥ 320	≥ 320	≥ 320	≥ 320
W12	160	≥ 320	≥ 320	≥ 320	≥ 320	≥ 320	≥ 320
W13	20	80	≥ 320	≥ 320	≥ 320	≥ 320	≥ 320
W14	≥ 320	≥ 320	≥ 320	≥ 320	≥ 320	≥ 320	≥ 320
W15	160	≥ 320	≥ 320	≥ 320	≥ 320	≥ 320	≥ 320
W17	10	20	80	160	≥ 320	160	80
W18 (Control)	10	10	40	80	80	10	80

*Vaccination dates: 13Jun2020, 04Jul2020, 02Apr2021, 10Jul2021

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In November 2021, Medgene sent a survey to deer farm owners. The objective of the survey was to determine the impact of EHD on vaccinated and unvaccinated herds. Table 3 represents a summary of the feedback we received from the survey.

Overall, vaccinated herds appeared to have a large reduction in mortality.

Table 3. EHD Survey Feedback for Vaccinated Versus Unvaccinated Farms

EHD Survey Feedback for Vaccinated versus Unvaccinated Farms							
	Total EHD Deaths	Total Other Deaths	Total Herd Size	Avg EHD Mortality Rate	Avg Other Mortality Rate	Total Herd Mortality Rate	Mortality Rate Range
Vaccinated Farms	40	118	2177	1.84%	5.42%	7.26%	2.63-30%
Unvaccinated Farms	183	16	683	26.79%	2.34%	29.14%	0-77.3%

Safety data has been collected by livestock owners and/or their herd veterinarian since the summer of 2019. Of the nearly 23,000 doses, sent to more than 70 farms, only 20 farms have reported adverse reactions. In general, users typically stated that vaccination caused lameness and lethargy for 2-7 days post injection with no further complications and animals returning to normal health within a week. Safety data includes vaccine use in 2 week old fawns up to mature adult white-tailed deer. There has also been one farm that used the vaccine in elk. Adverse reactions were similar, no matter the animal's age or species. Table 4 summarizes all adverse reactions reported from the use of Medgene's experimental EHD vaccine. Results have been very consistent year over year since 2019.

Table 4. Adverse Reactions After EHD Vaccination

Adverse Reaction	Number of Reports
Lameness/Muscle Soreness	15
Lethargy	6
Reduced Feed Intake	6
Injection Site Swelling	5
Fever	4
Injection Site Sore	2

The Missouri veterinarian that tested the EHDV2&6 vaccine in young fawns provided the following conclusion about safety:

100% of the vaccinated fawns experienced some level of adverse post-vaccinal reactions. However, we have vaccinated 20-40 WTD buck fawns three times per year and 25-35 pregnant WTD does once per year for the past decade using a variety of commercially available vaccines. It is my clinical impression that the incidence and severity of the reactions I observed following Medgene's EHD vaccine were comparable to those which I have consistently observed over the years following administration of commercial vaccines.



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