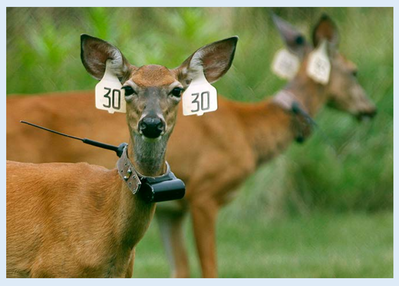


Vaccine field trial for EHDV does not produce antibody response

The Cost of Epizootic Hemorrhagic Disease (EHD)

Economic studies of the impact of EHD in livestock are scarce. But outbreaks in dairy cattle, beef cattle, reindeer, and white-tailed deer industries have resulted in losses. Concrete examples include:

- **$2.5M loss in dairy cow industry in Israel** (Kedmi et al. 2010)
- **$30M loss in farmed deer industry in Florida** (Wisely 2014)

and these estimates do not represent the cost of prevention or diagnosis.

Commercially available autogenous vaccines for the farmed cervid industry have been widely used. These vaccines are costly at $35 per animal. Administration requires a series of 3 injections and therefore has large personnel costs.

What are autogenous vaccines?

Autogenous vaccines are a type of killed virus vaccine. Biologics are prepared from cultures of virus derived from infected animals. The culture isolates are inactivated, sterilized and typically mixed with adjuvant. Autogenous vaccines are used when other types of vaccines are not effective or not available.

Advantages and disadvantages of autogenous vaccines

Pros	Cons
Can be a first line of defense when commercially licensed vaccines are not available	Can be contaminated with live virus, prions or fungi
Have been shown to produce protective antibodies in numerous instances	Protection is often incomplete and multiple boosters are required
Producers can test efficacy by monitoring vaccine outcomes	No efficacy testing is required of commercial autogenous vaccine producers

The Objectives of This Study

Deer farmers in Florida, USA lose between 2 and 50% of their herd each year to EHD. Many use a commercially available autogenous vaccine containing isolates of EHDV 1, 2, and 6 and BTV-17 from non-adjacent herds. No studies of efficacy have been performed on this vaccine in white-tailed deer.

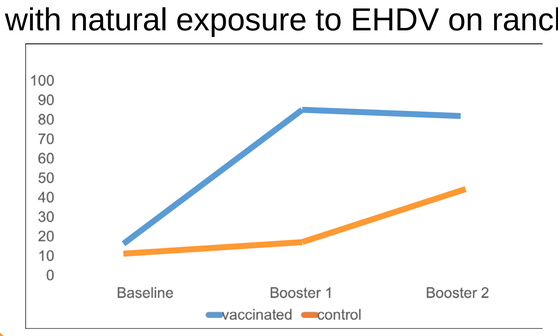
Case – Control Field Trials of Vaccine Efficacy

In field trials, we sought to determine if the commercially available vaccine produces an antibody response in a farmed herd of white-tailed deer in the panhandle of Florida.

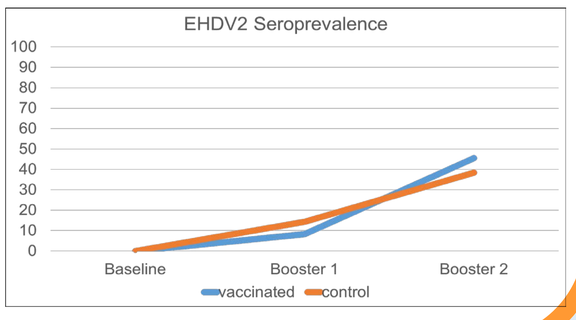
Twenty-six white-tailed deer fawns held in the same outdoor enclosure were either given a 3 course vaccine regimen (n=12) or remained unvaccinated (n=14). We stratified samples by sex and genetics. Serum was collected from each animal prior to vaccination (Baseline) and 14-20 days after each booster (Booster 1 & 2). Sera were tested for antibodies to EHDV1, 2 & 6 by virus neutralization assay.

Expectations

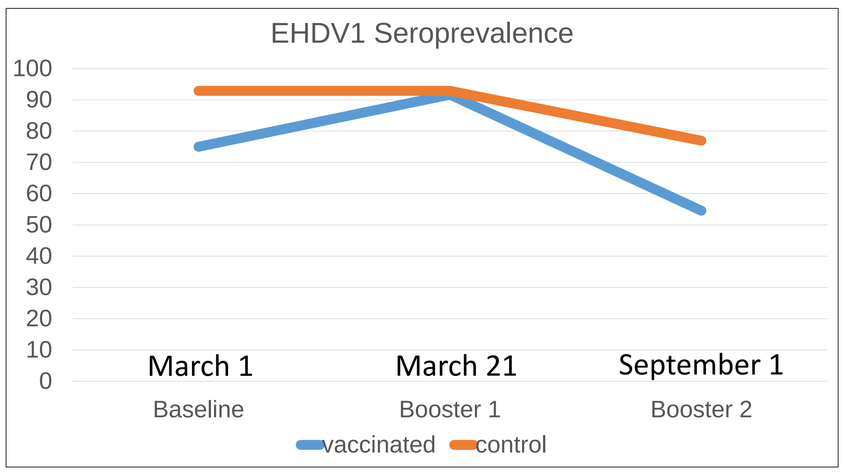
If the vaccine **produces antibodies** we expected vaccinated animals to increase their level of antibody after vaccination at baseline. We expected the control animals' level of antibody to fluctuate with natural exposure to EHDV on ranch.



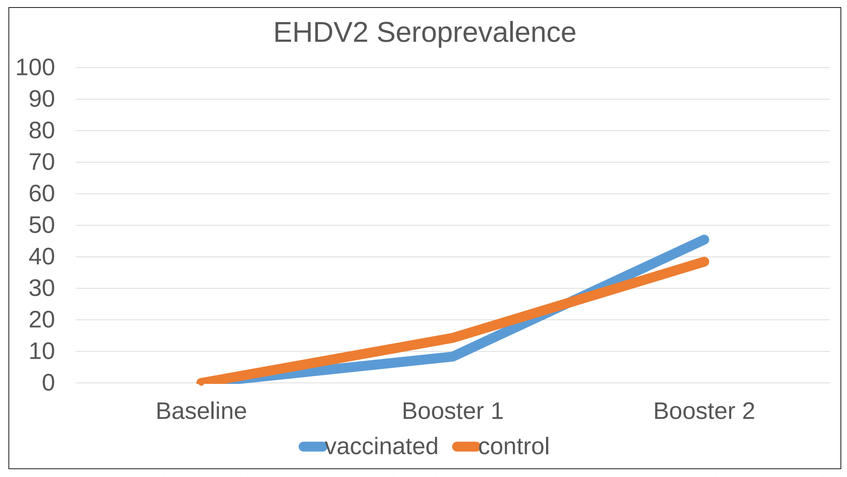
If the vaccine ***does not produce an antibody response*** we expected vaccinated animals to mirror control animals' level of antibody fluctuation.



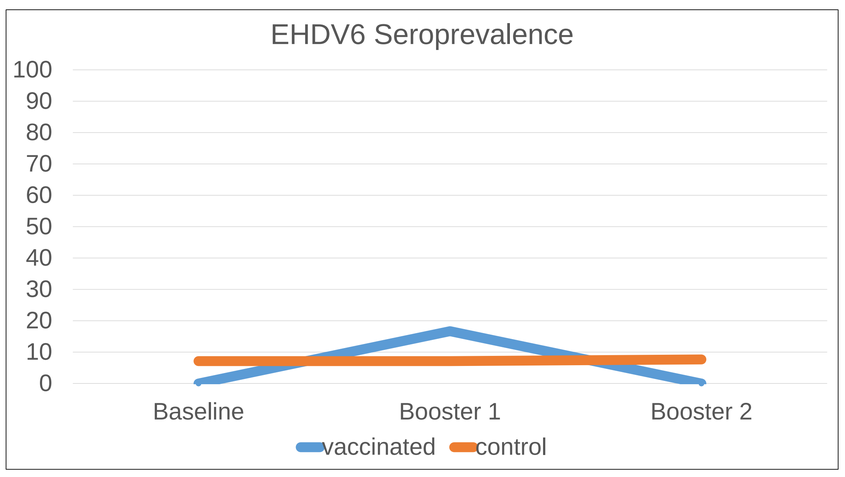
The vaccine did not produce antibody titers



EHDV1 was the most prevalent virus circulating on the ranch. No significant difference in proportion of seropositive animals among vaccinated and controls (Chi^2 = 1, df = 1, p = 0.2; controlling for repeated measures of individuals: Wald = 2.21, p = 0.14).



EHDV2 seroprevalence increased in the late summer on the ranch. No significant difference was observed in proportion of seropositive animals between vaccinated and controls (Chi^2 = 0, df = 1, p = 1.0 controlling for repeated measures of individuals: Wald = 0.08, p = 0.78).



EHDV6 seroprevalence remained low throughout the study on the ranch. No significant difference was observed in the proportion of seropositive animals between vaccinated and controls (Chi^2 = 0, df = 1, p = 1.0; controlling for repeated measures of individuals: Wald = 0.08, p = 0.78).

Conclusions

Vaccinated animals did not produce significant, measurable neutralizing antibodies to EHDV-1, -2 or -6 following vaccination. One unvaccinated animal died from EHDV; no other animals died from EHDV in this experiment.

Based on our results, CHeRI is not advocating the use of the Newport Vaccine formulated for adjacent herds as a sole measure of protection against EHD.. Our results demonstrate that the vaccine did not initiate the production of homologous antibodies for any of the three virus strains.

In the absence of a recombinant vaccine, we suggest keeping penned animals at low density and make daily visual inspections of the herd. Animals that appear lethargic or separate themselves from the herd should be given supportive care. Visit the CHeRI website for more information.

Questions? Comments? Contact Sam Wisely Email: wisely@ufl.edu, Website: www.wec.ufl.edu/cheri, Twitter: @UF_IFAS_CHeRI