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## UW study: All deer susceptible to CWD Genetic barriers won't stop disease

By Anita Weier  
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The hope that genetic resistance could eventually triumph over chronic wasting disease has been dashed by a University of Wisconsin-Madison study of deer in the core disease area in southwestern Wisconsin.

The study, accepted for publication in the *Journal of Wildlife Disease*, suggests that virtually all white-tailed deer are susceptible to the fatal disease, in which abnormal proteins cause deer and elk to waste away.

"These findings don't mean we're not going to be able to stop the disease, but it tells us we certainly can't count on genetic barriers to slow it down," said Judd Aiken, the study's senior author and a professor of animal health and biomedical sciences in UW-Madison's School of Veterinary Medicine.

The results of the study bolster the Department of Natural Resources' controversial tactic of killing as many deer as possible in the core disease area around Mount Horeb where the malady was discovered last year, in order to stop the spread of the disease to the rest of the state. Opponents of that strategy have argued that the deer do not have to be killed because if CWD ran its course, a herd would remain that could not get the disease because of its genes.

Unfortunately that's not true, said Aiken, a leading authority on prions, the nearly indestructible abnormal infectious proteins implicated as the cause of CWD. The normal function of the protein is not known, but when an animal is exposed to the disease, the normal protein converts to an infectious form.

"Almost all deer are going to be genetically susceptible to CWD. Statistically, we have a lot of confidence in our results," Aiken said.

"What does this say about the strategy of eradication? To my mind it supports it. We really don't have any other approach. Increasing the hunt will certainly slow the disease down."

The study examined DNA from 126 infected and uninfected deer killed in what was then a 411-square-mile area where the disease is endemic. This "eradication zone" is being enlarged to 874 square miles in Dane, Iowa, Sauk and Richland counties.

The team led by Aiken sequenced the prion protein gene known as PrP from the DNA found in deer cells. Virtually all of the deer harbored a form of the gene found in infected animals, he said. This indicates that between 86 and 96 percent of white-tailed deer in the region would be genetically susceptible to CWD, according to Aiken.

Similar genes exist in mice, sheep and humans, all prone to different types of prion diseases. But different species have different genetic predispositions, according to Aiken. About 40 percent of the human population is susceptible to variant Creutzfeldt-Jakob disease, the human prion disease.

Twenty-six of the animals studied were known to be infected with CWD. The other 100 tested negative, but could have been infected as testing for the disease tends not to detect its earliest stages. Virtually all of the animals, however, harbored the same prion gene as the infected deer.

The group is continuing the study, sequencing the gene from additional deer from throughout the state.

"We don't know how CWD transmits yet, but assuming that deer interact, our results show they all have a chance of getting the disease," Aiken said.

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