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Chronic Wasting Disease

(*unnamed protein prion*)

in Alberta

Common name

chronic wasting disease (CWD), prion disease of cervids (deer and elk), cervid spongiform encephalopathy

Scientific name

an unnamed protein prion

What's Bugging Wild Critters?

Fact sheet #10: CWD

Significance

Chronic wasting disease (CWD) is a prion disease with the potential to infect and cause mortality in deer and elk. To date its impact in wild populations appears limited to mortality of individual deer or elk in isolated areas of western and eastern United States as well as in Saskatchewan. Chronic wasting disease is a significant economic concern with farmed cervids. There is no evidence that CWD is a risk to the health of humans or traditional livestock health.

What? Where? How?

Chronic wasting disease is one of a group of diseases broadly lumped under the term *transmissible spongiform encephalopathies* (TSEs). This term simply means that these diseases can be passed from one individual to another and share the characteristic of being associated with holes or spaces in brain tissue. Each disease has a distinct form of abnormal protein, or prion, which can be used to identify and differentiate it from other TSEs.

The nervous system is the preferred habitat for prion disease agents. The changing of normal protein to abnormal protein leads to spaces in the brain tissue until eventually the microscopic structure of the brain looks somewhat like a sponge. Needless to say, such damage in vital tissues results in changes to behaviour, attitude, and metabolism that lead to clinical signs in infected animals.

CWD is known to occur only in cervids, indeed only in deer and elk. The disease can remain unnoticed as a "silent" infection for many years but eventually, infected deer and elk cannot maintain body weight and slowly waste away. Excessive salivation, lethargy, poor coordination, trembling, and drooping head and ears are common signs in individuals that show clinical signs. Infection appears to be fatal in all cases.

Although identified in the 1970s and 1980s, CWD probably existed in a localized area of Colorado/Wyoming/Nebraska for quite some time. We may never know where CWD came from but it may be the result of local mutation of a similar prion associated with scrapie in domestic sheep.

Transmission Cycle

To date, we do not know the specific mechanisms of transmission of CWD. The disease can pass from one individual to another and occasionally passes from females to their offspring. Infectious material also can survive in the environment for an unknown period of time.

Distribution in Alberta

In late March 2002, CWD was identified in a farmed elk in north central Alberta. The infection was detected during the provincial surveillance program that has been ongoing since 1996. Federal CWD-eradication programs were implemented immediately. All farmed cervids that moved on or off the premises in the previous three years as well as the current animals on the farm were killed and tested. No further CWD was found.

In early November 2002, CWD was identified in a farmed white-tailed deer in north central Alberta. As with the farmed elk, federal control and eradication programs were implemented immediately.

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One other infected farmed deer was found on the same premises as the first deer. No further cases were found.

Targeted surveillance of wild deer in the vicinity of the two infected farms has not detected any CWD in the wild.

Alberta has maintained a moratorium on the importation of farmed cervids since late in 1988. The greatest risk of further introduction of CWD is associated with movements of farmed elk or deer as well as movements of wild deer along the border with Saskatchewan.

Importance for Wildlife Management

The natural extent and effect of CWD in wild cervids appears to be limited. Mortality of deer and elk does not seem to affect overall productivity in infected populations in the short term, although some models applied to data collected in Colorado suggest that mule deer populations at the heart of the affected area may decline in 40-50 years. There are numerous CWD research projects underway to better define the host range, method of transmission, diagnostic tests, impact on wild cervids, and risk to the public and livestock.

The finding of CWD in wild and farmed white-tailed deer in eastern states (for example, Wisconsin and Illinois) is causing significant concern for wildlife managers. The high number of deer and elk farms and high density of wild deer (in the range of 30-40 white-tails/km^2 [75-100 white-tails/sq. mi.]) provide added risk of transmission. Rigorous control and eradication programs have aimed at eliminating CWD in these areas. However, more information is needed before all of the risks can be properly assessed.

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Dealing with CWD is made more difficult because it is often misrepresented as equivalent to bovine spongiform encephalopathy (BSE), the infamous "mad cow disease" a prion disease of bovids (cattle). The BSE has been associated with a similar prion disease in humans and poses worldwide concern for public health and agricultural economics. However, CWD and BSE are not the same and can be differentiated on various aspects of the known biology and molecular makeup of the agents.

Based largely on the perceived human health concerns, wildlife managers throughout western Canada and the U.S. expend considerable time, effort, and monies on surveillance programs aimed at defining where CWD does or does not occur in the wild. To date, infections in wild deer and elk populations are known from the shared boundary areas of Wyoming, Colorado, and Nebraska; the shared boundaries of Wisconsin and Illinois; and two areas in west-central and southwestern Saskatchewan.

In the U.S., CWD has been found to date in 7%-8% of wild white-tails outside a highly contaminated deer farm in Nebraska as well as isolated cases in wild deer in South Dakota, Utah, and New Mexico.

Alberta began surveillance of wild deer and elk in 1996. Voluntary submission of the heads of hunter-killed animals is the primary source of surveillance samples. Particular emphasis is placed in getting heads of deer killed along the Alberta/ Saskatchewan border and in the vicinity of the two positive game farms. *To date, all samples of wild deer and elk tested in Alberta have been negative for CWD.*

Public Significance

This disease poses significant economic problems for farmers of elk and deer. CWD was unintentionally introduced into farmed elk populations from live wild elk and deer taken from affected areas in the U.S. It was then translocated to farms in various states as well as Saskatchewan and Korea. The source of the infection on farms in Alberta is not known. The economics of trade in live elk and their products (primarily antler velvet) have been seriously affected. In addition, the association with BSE has led to possible public health concerns.

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For more information on wildlife diseases in Alberta: http://www3.gov.ab.ca/srd/fw/diseases/index.html

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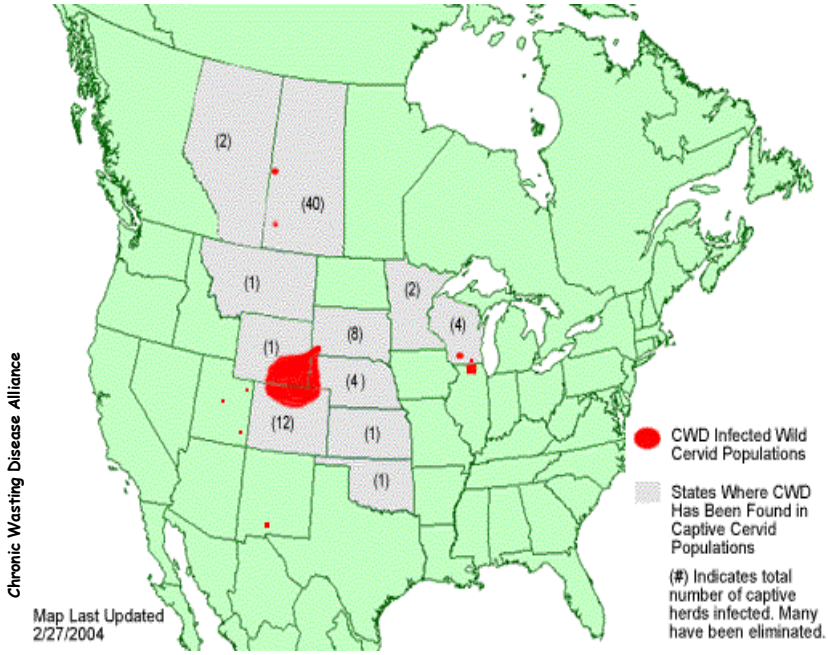
To date there is no scientific evidence to suggest that CWD can infect humans, and growing evidence that it is indeed quite different from BSE. The U.S. Centers for Disease Control advise that the human health risks from CWD, if any exist, are extremely low. However, as a precaution, the World Health Organization (WHO) recommends that all products from animals suspected of or infected with any prion disease should be excluded from the human food chain.

Prevention/Control

Chronic wasting disease is a federally reportable disease in Canada and appropriate surveillance and control programs are underway in farmed cervid populations. The procedures parallel those used to control and eradicate other federally reportable diseases, and include ongoing surveillance (testing of slaughtered animals, reporting of clinical signs), quarantine of suspect and confirmed affected premises, detailed trace outs from all known affected premises, destruction of infected herds, and compensation of owners of infected elk or deer. Affected premises are thoroughly cleaned and disinfected. "Minimally contaminated premises" can be restocked. Currently, premises judged to be a risk for significant environmental contamination cannot be restocked. Similar programs are underway in the US.

In addition, Alberta has stringent programs developed among government agencies, game farmers, and other stakeholders to continually search for evidence of CWD in farmed and wild cervids and to limit the possibility of introducing infections in animals imported into the province.



Summary

Chronic wasting disease has been identified in one farmed elk and two farmed white-tailed deer in Alberta; however, to date it was not found in over 19 000 heads of other farmed cervids nor in over 5000 heads of wild cervids from the province. CWD is a serious economic concern for elk and deer farmers in Alberta and therefore the federal and provincial governments take precautions to eradicate it whenever and wherever CWD is identified in captive cervids. Strict programs are in place to provide continual surveillance of farmed and wild cervids and to limit the risk of spreading or re-introducing this disease in Alberta.

Additional Information

Alberta Agriculture Food and Rural Development: http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/afs3779?opendocument

Chronic Wasting Disease Alliance: http://www.cwd-info.org/

Canadian Food Inspection Agency: http://www.inspection.gc.ca/english/anima/heasan/disemala/disemalae.shtml

For more information on wildlife diseases in Alberta: http://www3.gov.ab.ca/srd/fw/diseases/index.html

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