

Chronic Wasting Disease Transmission to Minnesota and Wisconsin Cervid Farms

1. Characterizing Risk of Chronic Wasting Disease Transmission Exposures

University of Minnesota researchers conducted a study funded by the Minnesota Board of Animal Health (BAH) to evaluate means by which cervid (deer, elk, and other deer family species) farms are exposed to Chronic Wasting Disease (CWD) and identify ways to reduce transmission risks. CWD, the transmissible spongiform encephalopathy of cervids, is thought to be caused by a malformed prion protein that causes brain cells to die. The disease threatens the health of both wild and farmed cervids. There is no treatment or vaccine for CWD; all animals on farms found to be infected are either destroyed or placed in long-term quarantine with on-going surveillance, resulting in severe economic losses to herd owners. More CWD information can be found at:

- USDA Animal and Plant Health Inspection Service (APHIS): <https://www.aphis.usda.gov/aphis/ourfocus/animalhealth/animal-disease-information>
- Minnesota BAH: <https://www.bah.state.mn.us/deer-elk/>
- Wisconsin Department of Agriculture, Trade, and Consumer Protection (DATCP): https://datcp.wi.gov/Pages/Programs_Services/AnimalDiseases.aspx

The researchers first identified potential exposures of CWD to farmed cervids, based on review of published scientific literature. These included **direct contact with infected live animals**, including farmed or wild cervids, and **indirect contact with infected animals** through cervid parts (brought to farms from hunting or taxidermy practices), shared equipment, feed and water, or contaminated feces from animal scavengers. The next step was to classify potential exposures for CWD transmission into categories of higher known risk, lower (or unknown) risk, or negligible risk (Table 1), based on current state of understanding of these risks.

Table 1. Risk of CWD transmission exposures to cervid farms

Potential exposures	Higher Known Risk	Lower (or Unknown) Risk	Negligible Risk
1. Direct contacts with infected cervids			
• Introduction of farmed cervids	<i>From farm later found to be CWD-positive</i>	<i>From farms with no CWD-positive animals in the 5 years before detection</i>	<i>No introductions in the 5 years before detection</i>
• Contact with wild cervids from farm location <50 miles from CWD-positive wild cervid	<i>Farm cervid escapes/re-entry or wild cervid entry</i>	<i>Single perimeter fencing</i>	<i>Double perimeter fencing or not <50 miles from positive cervid</i>
2. Indirect contacts with infected cervids			
• Introduction of cervid parts (hunting, taxidermy)	<i>From <50 miles from CWD-pos wild cervids</i>	<i>From other areas</i>	<i>No introductions</i>
• Sharing equipment, contaminated feed or water, scavengers	<i>With CWD-positive farms</i>	<i>From location <50 miles from CWD-positive wild cervids</i>	<i>No indirect contacts</i>

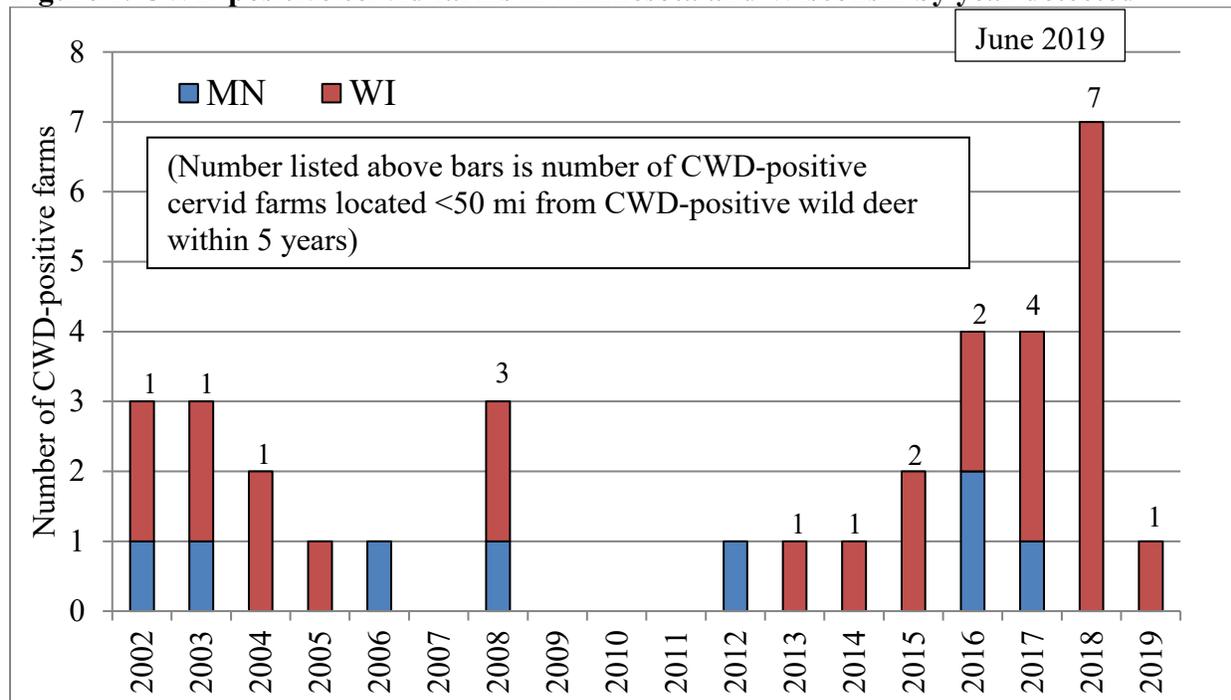
2. CWD in Minnesota and Wisconsin Cervid Farms

Through collaboration with the Minnesota BAH and the Wisconsin DATCP, the research team next reviewed records from the 34 CWD-positive cervid farms in Minnesota and Wisconsin detected from 2002 to January 2019 evaluate their potential exposures to CWD. While the total number of cervid farms in each state is similar, there are several differences between the states, including a larger region in Wisconsin with detected CWD-positive wild cervids as well as differences in CWD regulatory programs between the states.

Key findings from the review of the CWD-positive farms in Minnesota and Wisconsin:

- Of the 34 CWD-positive farms, 26 farms were located in Wisconsin, compared to 8 in Minnesota.
- 21 (62%) of the 34 CWD-positive farms tested positive since 2012, representing an increase in the rate of detection of new positive farms from previous years.

Figure 1. CWD-positive cervid farms in Minnesota and Wisconsin by year detected



- Most of the recently detected farms (since 2012) were located in Wisconsin (17 farms). 15 of these recently detected farms had exclusively white-tailed deer, 2 had exclusively elk (both in Wisconsin), and 4 had mixed inventories or other species.
- **Most CWD-positive cervid farms since 2012 were located within 50 miles of known CWD-positive wild deer.** CWD has been detected in wild deer in or within 10 miles of 42 of 72 Wisconsin counties (<https://dnr.wi.gov/topic/wildlifehabitat/documents/cwdaffectedcountiesdifferences.pdf>), compared to only a few counties in Minnesota to date (<https://www.bah.state.mn.us/deer-elk>).

3. Risk of CWD Transmission Exposures to Minnesota and Wisconsin Cervid Farms

Key findings from the review of the CWD-positive farms in Minnesota and Wisconsin:

Results from the record review are summarized below, based on the categorization in Table 1. These data show:

- **56% of CWD-positive farms (n=19) experienced one or more known higher risk CWD exposures** (described in Table 1). Of these 19 farms, 63% (12) introduced cervids from another farm later detected with CWD, 42% (8) reported wild deer entered farm pens or farmed cervids escaped and re-entered in areas with CWD in wild deer, and 11% (2) reported exposure of the farm to cervid parts from areas with CWD in wild deer through hunting or taxidermy practices. Some farms reported multiple exposure pathways.
- **Notably, 44% of CWD-positive farms (n=15) did not have known higher-risk CWD exposures.** Sixty-two percent of the CWD positive herds detected since 2012 fell into this category, compared to only 15% of those detected prior, indicating potential changing farm exposures to CWD. Most of these 15 herds had added animals from herds without test-positive animals in the previous 5 years (80%), though some had no new additions (20%). Since current tests detect CWD only in dead animals, the potential exists for animals purchased from tested herds to have been unknowingly infected.
- **Most CWD-positive farms (85%) without known higher risk exposures were located within 50 miles of CWD-infected wild deer.** Of these 11 herds, 73% had single and 27% had double perimeter fencing to prevent direct contact with wildlife. CWD detection in herds despite fencing barriers and with no animal movements from other positive farms indicates the potential significance of indirect contact exposures in locations with infected wildlife, and the critical need for research to identify practices to minimize these risks.