WHY ARE WE CONCERNED ABOUT CWD?

- Impacts of CWD on population dynamics of deer and elk are being studied but are currently unclear. Computer models suggest cervid populations infected with CWD could have substantially lower adult survival rates, resulting in smaller populations with fewer trophy animals over time. Something like this could take decades, which is comparable to a "glacier" moving across the landscape, slowly changing the population structure; whereas, HD (hemorrhagic disease) is an "avalanche" that kills quickly within relatively short bursts of time. HD comes and goes and CWD never goes away.
- Ultimately, public and agency concerns and perceptions about human health risks associated with all TSEs may erode hunters' confidence and their willingness to hunt in areas where CWD occurs. Loss of revenue will affect all game agencies and their ability to manage and monitor all wildlife populations over time.

WHAT IS BEING DONE ABOUT CWD?

Efforts to address CWD are continuing across the U.S.

- Several state wildlife agencies are aggressively collecting and testing wild elk and deer for the presence of CWD and have instituted surveillance programs to test hunter-harvested deer and elk.
- Some state wildlife agencies are considering adopting or have adopted regulations regarding the transportation of hunter-harvested deer and elk carcasses out of known CWD areas. Many states have implemented regulations that allow only boned meat, quarters (without spinal column or head) or processed meat from deer or elk to be transported out of certain CWD areas.
- Jurisdiction over commercial captive cervid operations varies from state to state. In some states the regulatory authority resides with the state agricultural agency, others with the state wildlife management agency, and in some the authority is shared between agricultural and wildlife management agencies. When CWD is detected in a captive cervid facility, generally that facility is quarantined, and all captive cervids in that facility are killed and tested after indemnity payment to the facility owner is approved by USDA.
- Several states have recently implemented a moratorium on the importation of live cervids. Some states have also halted intra-state movement of deer and elk and banned supplemental feeding programs.
- CWD surveillance of captive cervid farming operations is not yet regulated by the federal government, but some states, in cooperation with the industry, conduct CWD surveillance and have captive herd certification programs. A cooperative surveillance program began in 1997 among some states and the U.S. Department of Agriculture's Animal and Plant Health Inspection Service (APHIS). This program remains voluntary.
- Federal legislation is often introduced to provide additional funding for CWD research and control efforts and upgrade diagnostic laboratories.
- All states are trying to educate their hunters about the seriousness of CWD and its effects on the long-term sustainability of healthy wild cervid populations.

WHAT PREVENTIVE MEASURES SHOULD HUNTERS TAKE?

- Hunters, especially in CWD areas, are advised to bone out their meat to avoid transporting carcasses to uninfected areas. Prions reside in carcasses, and an infected carcass has the potential to start a new focus of disease in a previously uninfected area. **In Kansas, leaving evidence of sex attached to one quarter is required in order to leave a boned-out carcass taken with an antlerless permit at the kill site. The hunter also has the option of using Electronic Deer Check-in (https://programs.ksoutdoors.com/Programs/Electronic-Deer-Check-in).**
  Deer taken with either-sex permits can be boned out in the field, leaving the carcass in the field at or near the kill site without leaving evidence of sex attached or using Electronic Deer Check-in. The carcass tag stays with the meat.
- Do not shoot, handle, or consume an elk or deer that is acting abnormally or appears to be sick or are found dead. Report sick or abnormally behaving deer or elk to the county game warden or biologist.
- When field-dressing game, wear rubber/nitrile/latex gloves and avoid cutting/sawing through the brain or spinal cord (backbone).
- Bone out the meat at the site of the kill or in the same county as the kill.
- Minimize contact with and do not consume brain or spinal cord tissues, eyes, spleen, or lymph nodes.
- Always wash hands thoroughly after dressing and processing game meat.
- Stop the movement of prions to new areas by not moving a carcass from one area and discarding the carcass or its parts on the landscape in another area. Hunters traveling across state boundaries should know the regulations for transporting cervid carcasses or parts in each state they will travel in.

WHERE CAN I LEARN MORE ABOUT CWD?

Additional information is available on the Chronic Wasting Disease Alliance website (www.cwd-info.org), CDC (www.cdc.gov/prions/cwd/index.html), KDWP (https://ksoutdoors.com/Hunting/Big-Game-Information/Chronic-Wasting-Disease-CWD), and USGS (https://www.usgs.gov/centers/nwhc/science/chronic-wasting-disease?qt-science_center_objects=0#qt-science_center_objects). Also, the links to state wildlife agencies provide considerable in-depth information regarding the status of CWD in those states.

IS THE MEAT SAFE TO EAT?

At this time, there is no evidence that CWD has been transmitted to humans. Despite our increasing understanding and knowledge of the disease, there continues to be gaps in our complete understanding of the disease. Due to this uncertainty, its similarity with other known TSEs, and potentially long-term incubation time, hunters should not eat meat from animals known to be infected with CWD or exhibiting signs of any disease. **Thoroughly cooking CWD-positive meat does not destroy prions. Prion destruction via heat starts at around 1,000 degrees F for an extended time, well beyond normal cooking temperatures.**

Each hunter makes the final decision whether to consume harvested wildlife. KDWP does not recommend eating any wildlife known to be sick or diseased. KDWP cannot tell anyone that any animal is safe to eat.

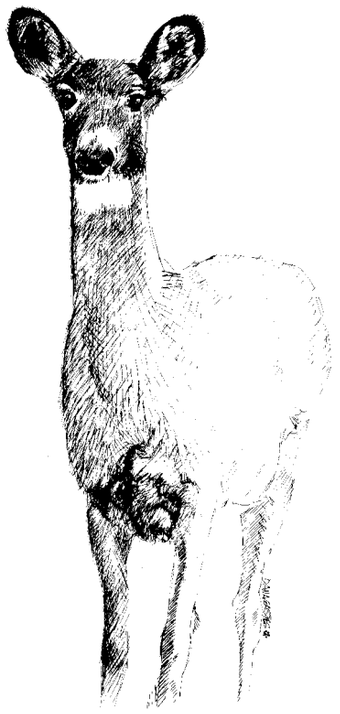
Bullet points from the Centers for Disease Control and Prevention regarding CWD precautions:

- When field-dressing a deer: Minimize how much you handle the organs of the animal, particularly the brain or spinal cord tissues. Do not use household knives or other kitchen utensils for field dressing.
- Check state wildlife and public health guidance to see whether testing of animals is recommended or required. Recommendations vary by state, but information about testing is available from many state wildlife agencies.
- Consider having the deer or elk tested for CWD before you eat the meat.
- If you have your deer or elk commercially processed, consider asking that your animal be processed individually to avoid mixing meat from multiple animals.
- If your animal tests positive for CWD, do not eat meat from that animal.

Produced by
Kansas Department of Wildlife and Parks
and Chronic Wasting Disease Alliance.

CHRONIC WASTING DISEASE

QUESTIONS AND ANSWERS



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WHAT IS CHRONIC WASTING DISEASE (CWD)?

Chronic Wasting Disease (CWD) is a contagious, neurological disease that affects deer, elk, moose and other cervids. CWD is caused by the deposition and clumping of abnormal proteins (prions) in the brain that kills neurons, resulting in cytoplasmic vacuolation and a characteristic sponge-like degeneration of the brains of infected animals. **Symptoms only manifest toward the end of the 16-24-month incubation period before the cervid dies; therefore, most CWD-positive cervids are asymptomatic and look normal and healthy when they are harvested.**

CWD belongs to a group of diseases known as transmissible spongiform encephalopathies (TSEs). Within this family of diseases, there are several other variants that affect domestic animals. Examples of TSEs include scrapie, which has been identified in domestic sheep and goats for more than 200 years; bovine spongiform encephalopathy (BSE) in cattle (also known as "mad cow" disease); and transmissible mink encephalopathy (TME) in farmed mink.

A human form, Creutzfeldt-Jakob disease (CJD), occurs naturally and spontaneously in about one out of every one million people worldwide. Starting in the 1980s, Variant Creutzfeldt-Jakob disease (vCJD) was caused by the consumption of beef from the large-scale outbreak of BSE in cattle herds in Great Britain. As of 2019, 232 people contracted vCJD from the BSE event. It must be noted that BSE is a different TSE than CWD, and CWD transmission to humans has not been documented to date. Due to the similarities of prions and a host of lab experiments, hunters and others eating venison should take certain precautions to reduce their risk of exposure to abnormal prions.

Impacts of CWD on population dynamics of deer and elk are presently unclear. Population impacts have been documented in mule deer, white-tailed deer and elk in certain geographic areas, but it is uncertain whether CWD will impact herds on a larger geographic scale. Computer models suggest that over the next several decades, cervid populations infected with CWD could have substantially reduced adult survival rates and destabilized long-term population dynamics resulting in smaller populations with few older animals (trophy animals).

WHAT CAUSES CWD?

The most widely accepted and supported theory is that the agent is a prion, an abnormal form of cellular protein most found in the central nervous system and in lymphoid tissue. The prion "infects" the host cervid (deer, elk, etc.) by promoting conversion of normal cellular protein to the abnormal form that cannot be broken down by the chemistry of the infected animal, thus, resulting in prion accumulation and eventual neuronal death.

The CWD infectious agent is smaller than most viral particles and does not evoke any detectable immune response or inflammatory reaction in the host animal. The CWD prion is resistant to enzymes and chemicals that normally break down proteins.

WHAT WILDLIFE SPECIES ARE AFFECTED BY CWD?

Species of the deer family known to be naturally susceptible to CWD include elk, mule deer, white-tailed deer, moose, black-tailed deer, Sika deer and reindeer(caribou). Knowledge about susceptibility of other members of the deer family (cervids) and other wildlife to prions is progressing as more is learned about prion strain types and infectivity.

CAN LIVESTOCK GET CWD?

There are no documented cases of cattle or other domestic livestock getting a TSE from natural exposure to CWD prions; however, the disease has been experimentally reproduced in cattle by the direct injection of CWD prions into cattle brains. Injections like this do not happen in the natural environment, and it is believed that transmission is prevented in the gut. Research is always being conducted to study TSE transmission questions.

CAN HUMANS GET CWD?

Although many try to compare CWD with "mad cow disease," the two diseases are distinctly different. Public health officials do recommend that human exposure to the CWD prion be avoided as they continue to evaluate potential health risks. Lab experiments indicate the risk to humans is small but not zero.

During the period 1997-1998, three cases of sporadic Creutzfeldt-Jakob disease (CJD) occurred in the U.S. in young adults. These individuals had consumed venison. This led to speculation about possible transmission of CWD from deer or elk to humans. However, review of the clinical records and pathological studies of all three cases by the Centers for Disease Control and Prevention in Atlanta, Georgia, did not find a causal link to CWD.

Nonetheless, health and wildlife officials advise caution. Prions evolve (change) as they pass through different organisms, and transmission dynamics are complicated and not fully understood. Macaques, a nonhuman primate, have contracted CWD from only consuming CWD meat. **Hunters are encouraged not to consume meat from animals known to be infected with CWD, as well as not consuming meat from any diseased animal. If hunters are hunting in an area where CWD has been documented in the deer herd, they should strongly consider having their deer tested for CWD.**

HOW DOES CWD SPREAD?

It is not known exactly how CWD is transmitted. The infectious agent may be passed from deer to deer in feces, urine, saliva, and infected carcasses, or picked up from the environment, mainly soil, and possibly plants. The primary mode of transmission is thought to be from animal to animal, although maternal transmission (mother to fetus) can occur in utero. The minimal incubation period between infection and development of clinical disease appears to be approximately 16 months. The overall range from infection to clinical disease can vary from 16-24 months.

Because CWD infectious agents are extremely resistant in the environment, transmission may be both direct and indirect. Concentrating deer and elk in captivity or by artificial feeding or baiting probably increases the likelihood of both direct and indirect transmission between individuals. Prion-contaminated pasture soils may have served as sources of infection in some areas. The apparent persistence of the infectious prions in contaminated environments represents a significant obstacle to eradication of CWD from either captive or free-ranging cervid populations. Once CWD prions bind to clay particles in soil, the prions become highly infectious. Infected deer will excrete more infectious prions throughout the course of its life (urine, feces, saliva, breath, etc.) than will be present in the tissues of the animal at the time of its death.

The movement of animals is one of the greatest risk factors in spreading the disease into new areas. While natural movements of wild deer and elk contribute to the spread of the disease, human-aided transportation of both captive and wild animals greatly exacerbates this risk factor. More importantly, moving infected carcasses to new, unaffected areas also likely contributes to the geographic spread of CWD.

WHERE AND HOW DID CWD ORIGINATE?

The origin of CWD is unknown, and it may never be possible to definitively determine how or when CWD arose. It was first recognized as a syndrome in captive mule deer held at a wildlife research facility in Colorado in 1967, but it was not identified as a TSE until the 1970s. Computer modeling suggests the disease may have been present in free-ranging populations of mule deer for more than 40 years, and magnified once infected animals were housed at the research facility.

Scrapie, a TSE of domestic sheep, has been recognized in the United States since 1947, and it is possible that CWD prions were derived or evolved from scrapie prions. It is possible, though never proven, that deer may have encountered scrapie-infected sheep, either on shared pastures or in captivity somewhere along the front range of the Rocky Mountains where high levels of sheep grazing occurred in the early 1900s.

It may also be possible that CWD is a spontaneous TSE that arose in the wild or in captivity and has biological features promoting transmission to other deer and elk.

WHAT ARE THE SYMPTOMS OF CWD?

Symptoms include but are not limited to drastic weight loss (emaciation), stumbling, excessive salivation (drooling), lack of coordination, listlessness, excessive thirst or urination, drooping ears, and lack of fear of people. Clinical symptoms almost always appear in older animals because of the 16-24-month incubation (prion accumulation) time. As more fawns or yearlings become infected, the probability of seeing older deer with symptoms should increase. This seems to be the case with states that have had the disease for a longer time. However, predators often see, kill, and eat these vulnerable, symptomatic animals long before they are seen by humans. CWD-positive deer are often observed near outbuildings at farmsteads or near bodies of water.

The most obvious and consistent clinical sign is weight loss over time. CWD-affected animals continue to eat but amounts eaten are reduced, leading to gradual loss of body condition and an emaciated appearance. Excessive drinking and urination are also common in the terminal stages. Aspiration pneumonia is the actual cause of death in most cervids afflicted with CWD.

Behavioral changes also occur in most cases, which may include decreased interactions with other animals, lowering of the head, wide stance, excessive grinding of teeth, and repetitive walking in set patterns. In elk, behavioral changes may also include hyper-excitability and nervousness.

HOW IS CWD DETECTED?

Currently, the only conclusive diagnosis involves an examination of the brain stem or lymph node tissue from dead cervids. When mass testing is conducted, the medial retropharyngeal lymph nodes are the preferred tissue. These tissues are thinly sliced with a microtome and stained with special chemicals and dyes. Using a microscope, the characteristic microscopic spongiform lesions and/or accumulation of the CWD associated prion protein in brain and lymphoid tissues can be seen. This technique is called immunohistochemistry (IHC), which is the gold standard CWD test.