

Transport and Disposal of Hunter-killed Cervid Carcasses: Recommendations to Wildlife Agencies to Reduce Chronic Wasting Disease Risks

Carcass Transport and Disposal Working Group
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Executive Summary

Attention to carcasses of hunter-killed cervids (deer, elk, and moose) may be justified as one component of a comprehensive program to prevent chronic wasting disease (CWD) introduction to new areas.

The risk of CWD introduction via carcasses is unknown, but can be significantly reduced by the proper disposal of higher risk tissues. Consequently, programs to enhance proper disposal of carcass parts are strongly recommended.

The management of CWD likely will continue to rely to some degree on the removal of animals from affected cervid populations by hunting and this management approach should reduce the risk of spread to new areas.

If states with CWD do not have carcass policies that reduce risks to levels acceptable to states that have not detected CWD, states in which CWD has not been detected may promulgate stringent policies that could reduce non-resident hunting in CWD-positive states.

Public education, with or without regulations, is the primary strategy to minimize risks for spreading CWD via carcasses, because enforcement of regulations is extremely difficult.

States can choose a regulatory or non-regulatory approach to carcass transport and disposal issues.

Notification of the hunter and the home state wildlife agency is a critical component of this risk management approach.

Hunter confidentiality issues can be resolved by adding a statement on non-resident licenses indicating that the home state agency will be contacted if the hunter's animal tests positive for CWD and the hunter's signature on the license indicates his/her acceptance.

Introduction

Chronic wasting disease (CWD) is a transmissible spongiform encephalopathy (TSE) that was first found in wild cervids in Colorado and Wyoming. Since 2000, Illinois, Kansas, Nebraska, New Mexico, New York, South Dakota, Utah, West Virginia, Wisconsin, Alberta, and Saskatchewan also have found CWD in free-ranging mule deer, white-tailed deer, or elk, and the disease may pose a threat to the long-term viability of populations of these species throughout North America. Additionally, a single naturally infected moose was found in Colorado in 2005. The potential severity of negative impacts of CWD on wildlife resources justifies a comprehensive approach to prevent its spread to new areas. The following recommendations encompass just one aspect of what should be a comprehensive preventive program, and are targeted at minimizing the risks of CWD introduction via the transport and disposal of cervid carcasses.

Risk factors for the introduction of CWD to new areas are not completely understood. The spread of CWD among captive cervid herds via the movement of live captive animals is well documented. Similarly, CWD appears to have spread naturally in some areas via dispersal and/or migratory movements of free-ranging cervids. Concerns also have been raised about carcasses of hunter-killed cervids from affected areas as a possible source of CWD introduction. These concerns are based on annual documentation of the improper disposal of infected hunter-killed cervid carcasses at locations remote from CWD-affected areas. Also of concern is the determination that skeletal muscle from deer with end-stage CWD was infectious when inoculated intracerebrally in transgenic mice engineered to express cervid prion protein (Angers et al, 2006); and confirmation that carcasses of deer with severe clinical disease can be an environmental source of CWD for uninfected animals, at least under controlled experimental conditions (Miller et al, 2004). The findings of Angers et al and Miller et al. should be interpreted in context and should not be regarded as confirmation that carcasses of hunter-killed deer and elk have or will spread CWD to new areas, because neither experiment simulated a situation involving the field-dressed carcass of an apparently healthy, infected, hunter-killed animal.

The risk of CWD introduction via transport of carcasses of hunter-killed, wild cervids appears small, especially when compared to the risk of introduction via the movement of living, infected animals. One possible exception may be the improper disposal of large quantities of infectious material by game processing or taxidermy facilities. Therefore, a comprehensive program to prevent CWD introduction into new areas should minimally address live cervid movement in the private and public sectors, transport of carcasses of captive and wild cervids, and disposal of carcasses and parts by hunters, game farmers, game processors, taxidermists, and others. Additional risk factors may be identified in the future and preventive programs should adapt to reduce or eliminate them.

Proper disposal of carcasses, trims, and parts would virtually eliminate the risk of CWD introduction via infected cervid carcasses, regardless of the origin, destination, or infection status of the animal. Wildlife agencies seldom have addressed disposal of potential CWD risk materials in disease prevention programs, but rather have developed or considered carcass transport recommendations or regulations as substitutes for proper disposal. It should be recognized that an absence of state wildlife agency policies on the disposal of CWD risk materials may create a perceived need for other state or federal agencies to enter this arena. Programs to improve hunter/game processor/taxidermist behavior regarding proper disposal of carcass parts are strongly recommended.

Public education, with or without regulations, is the primary strategy to minimize risks for spreading CWD via carcass transport and disposal. All states consider public education essential, and most have educational programs to promote awareness and responsible behavior regarding CWD risks. Public education programs must be science-based with a clear, well-justified, and repeated message. To date, programs generally have encouraged hunters to take only boned meat, hides, and antlers out of CWD-endemic regions. However, higher risk infectious materials, including tissues from the central nervous and lymphoid systems, continue to move out of these areas. Consequently, educational efforts must be enhanced, or coupled with regulation and enforcement to emphasize the importance of compliance with preventive measures.

Regulations, where used, should not be so restrictive that they substantially hinder hunting activities, or so lax that they do not reduce risk. To promote compliance, they must be well-justified, uncomplicated, and understandable. Regulations may be developed by states/provinces/areas of origin to control the movement of carcass parts out of affected areas, or by destination states/provinces/areas to control the importation of carcass parts into non-affected areas. To date, source state regulations have been inconsistent or lacking and have contributed to the adoption of import regulations by destination states. Import regulations also have been inconsistent, have caused confusion among hunters, and have been viewed by some CWD-positive states as an imposed “quarantine.” It is important to note that if states with CWD do not have carcass policies that reduce risks to levels acceptable to states that have not detected it, states that have not detected CWD may promulgate stringent policies that could reduce non-resident hunting in CWD-positive states.

It is prudent to recognize and manage the potential risks associated with carcass movement and disposal. It also is important to acknowledge that managing carcass transport and disposal is a single component of what should be a comprehensive plan to prevent CWD introduction to new areas. Carcass transport and disposal safeguards should not be so difficult that they diminish the ability to control CWD-infected populations through hunter harvest. Removal of live, infected animals from these populations is presumed to be a more effective overall strategy for controlling CWD within and outside affected areas, and reduction of population densities may continue to be pursued to reduce transmission opportunities. Without the cooperation and active participation of hunters, it is assumed that cervid populations and infection rates could grow until limited by CWD or other factors, and the conditions simulated in the Miller experiment may be recreated on native ranges where CWD occurs.

The Carcass Transport and Disposal Working Group of the International Association of Fish and Wildlife Agencies (IAFWA) Fish and Wildlife Health Committee developed the following guidelines for regulatory and non-regulatory approaches to carcass transport and disposal. The intent of the working group is to encourage states to adopt policies that minimize risk; do not hinder hunting, wild cervid population management, or disease control; are easily understood; and promote compliance because they are consistent and well-justified. The recommendations are based on current knowledge of CWD and may be updated when new information becomes available. The Working Group recognizes state wildlife management agencies will tailor their approach to fit individual concerns and situations, and asks that agency directors, through IAFWA, give serious and urgent consideration to this matter so that this potential risk of CWD spread can be minimized.

Uniform Recommendations and Education

Perhaps the most effective, uniform approach would be for all states to consider a mandatory, uniform carcass or parts disposal rule or policy that required hunters, game processors, taxidermists, and others to dispose of all carcass waste, other than tissues discarded while field dressing a cervid on site, in an approved landfill or other acceptable method, as determined by that state's wildlife agency and department of environmental quality. Most game processors and taxidermists already do this and it is a reasonable requirement for a state to impose on its citizens no matter where they hunt. States can better reduce risks within their borders by managing behavior of hunters when they are physically present in the state, whether as a resident or non-resident. Anti-littering statutes are appropriate, but are difficult to enforce.

Providing hunters, game processors, taxidermists, and others with timely, accurate information allows them to make informed decisions about their actions related to CWD. Whether wildlife agencies pursue a regulatory or non-regulatory approach, informing hunters of proper transport and disposal should be considered a critical part of a comprehensive plan to prevent the spread of CWD. Wildlife agencies should encourage hunters to follow all recommendations and regulations for carcass handling and disposal if they choose to hunt in areas where CWD is known to occur. Information should be available at websites of wildlife agencies and the CWD Alliance (www.cwd-info.org). Videos, brochures, direct mailings, new releases, public service announcements, and paid advertisements can reach sportsmen. Available information should include:

Viscera in the field: Material left in the field by hunters typically includes thoracic and abdominal viscera. The head and spinal cord also will be left if the animal is boned out at the site. It is unknown if material normally left in the field contains an infectious dose of CWD material but the total amount would be less if the head and spinal column do not remain. All tissues taken from the field should be disposed of properly.

Proper disposal of carcass and trims/parts/scraps: If all unwanted carcass parts, scraps, and trims removed from the field were disposed of properly, the risk of CWD introduction via carcass transport would essentially be eliminated. Throughout North America, responsible agencies should recommend that hunters, game farmers, game processors, and taxidermists properly dispose of all waste from processed cervids. Interim practices for disposal of potentially contaminated CWD carcasses and wastes that were recommended in November 2004 by the U.S. Environmental Protection Agency recognized the current reliance of hunters on landfills to dispose of parts and occasional carcasses and affirmed there is no reason to believe this practice is inappropriate.

Agencies should inform hunters about known disease status (presence/absence and estimated prevalence, if available) and provide educational materials on proper disposal of carcass trim and other unwanted material from harvested cervids. Carcasses of harvested animals should be field dressed and boned out in the field or by a local game processor prior to transport outside CWD-affected areas.

Hunter and home state wildlife agency management notification: States should immediately notify hunters, as well as the home state wildlife management agency of non-resident hunters, when a harvested animal tests positive for CWD. Contact should be by telephone followed up with a letter. Notification should include recommendations on proper disposal of any undesired material from a

CWD-positive carcass. Additionally, nonresident hunters should be advised to contact their home state wildlife management agency for disposal instructions and assistance. Prompt hunter notification allows the opportunity to answer any questions, determine which parts of the carcass have been transported, and assist with proper disposal of unwanted carcass parts.

Nonresident hunters who choose to hunt in CWD-affected areas should be notified in advance that their home state wildlife agency will be contacted and advised of the positive test result and the hunter's identity. If hunter confidentiality is an issue, this can be resolved by adding a statement on nonresident licenses indicating agency notification will occur if a harvested cervid tests positive for CWD: the hunter's signature on the license indicates acceptance of this notification process.

Carcass parts acceptable for transport: Cervid hunters who choose to hunt in CWD-affected areas should transport only meat with no portion of the spinal column or head attached, finished taxidermy mounts, hides without the head, cleaned teeth, and antlers with or without skullcaps. If still attached, skullcaps should not contain brain or other soft tissue.

Use of professional game meat processors and taxidermists: Use of professional meat processors and/or taxidermists should present little opportunity for environmental contamination because of their practice of disposing scraps by approved methods. However, targeted information programs should be implemented to enhance proper disposal by taxidermists and meat processors.

Disposal at landfills: Properly licensed and operated landfills offer one of the best options for disposal of carcasses and parts. Cooperative agreements between the state wildlife agency and the agency regulating landfills will facilitate the disposal of tissues. Public information programs should advise everyone hunting in-state or out-of-state on proper disposal methods, landfills that will accept parts, and proper home processing. Unwanted carcass parts disposed of in a landfill would be inaccessible to other cervids, and appropriate use of landfills by hunters, taxidermists, and game processors would essentially eliminate potential transmission of CWD via carcasses.

Disposal of bones, head, and other parts when the cervid is processed at home by resident and non-resident hunters: Disposal of all carcass parts from home processing should be in an approved landfill that accepts these parts. Each state wildlife agency should develop a list of these landfills to disseminate to hunters. Cooperation with the agency regulating landfills is very important and a formal or informal agreement with the appropriate agency will facilitate this effort.

Centralized sites/methods for disposal of CWD-positive or high risk carcasses: Several states have established disposal sites for carcasses potentially contaminated with CWD. The agreement between the Utah Division of Wildlife Resources and the Utah Environmental Protection agency (available on request) is an excellent example of interagency cooperation on disposal. Each state should investigate the possibility of similar agreements and centralized disposal sites and methods.

Regulations for CWD-Positive States (Carcass Origin States)

CWD-positive state regulations should provide protection against the spread of CWD via carcass transport to new areas within the state as well as to other states. Within-state enforcement is difficult, especially where "general" licenses are used and sportsmen are not restricted to specific areas. It should

be recognized that enforcement by CWD-positive state wildlife agency authorities becomes impossible when a hunter enters an adjacent state, which is the time the violation occurs.

Recommended approach to regulation: The draft regulation presented below would reduce risks within a CWD-positive state and for other state; however, enforcement could be problematic:

1. It is unlawful to remove a dead cervid from any game hunt area, equivalent wildlife management area, or county, which has had free-roaming cervids diagnosed with Chronic Wasting Disease and has been designated a Chronic Wasting Disease positive area by {insert state name}, except the following portions of the carcass:
 - Meat with no part of the spinal column or head attached;
 - Meat that is boned out;
 - Cleaned hide with no head attached;
 - Skull plate cleaned of all meat and brain tissue;
 - Antlers with no meat or soft tissue attached;
 - Upper canine teeth, also known as buglers, whistlers, or ivories; or
 - Finished taxidermy mount.

2. The Chronic Wasting Disease-affected game hunt areas shall be available through the {insert state name} wildlife management agency and provided to the CWD Alliance website.

Regulations for States That Have Not Found CWD (Carcass Destination States)

For those states that are free of the disease, regulations on the part of the destination state may provide additional protection against CWD introduction via carcass transportation if risks are not adequately reduced by CWD-positive states. Enforcement is admittedly difficult, but a regulation emphasizes the importance of the misdeed and serves to reinforce recommendations and educational programs. Specific importation bans essentially represent an attempt to regulate behavior of a state's residents while they are out of state.

Banning importation of any cervid parts from an entire state may convey the wrong message to the public. It encourages the perception that most or all cervids throughout a state are affected, which is untrue for any state, and could influence sportsmen to hunt elsewhere. This could reduce the ability of the state wildlife agency to manage cervid populations, and potentially CWD, through hunting.

Destination state regulations based on individual biological or administrative management units within carcass origin states, rather than on the entire state, must rely on prompt reporting of new CWD-affected areas by positive states, and on the destination state law enforcement officers' knowledge of individual management units in states that often are far away. These factors complicate the individual game management unit approach to regulation.

Recommended approach to regulation: The draft regulations presented below would reduce risks for CWD introduction through carcass transport; however, enforcement could be problematic.

1. It is unlawful to import dead cervids or their parts from any game management unit, equivalent wildlife management unit, or county, which has had free roaming deer, elk or moose diagnosed with chronic wasting disease and has been designated a Chronic Wasting Disease positive area by the appropriate state wildlife agency, except the following portions of the carcass:
 - Meat with no part of the spinal column or head attached;
 - Meat that is boned out;
 - Cleaned hide with no head attached;
 - Skull plate cleaned of all meat and brain tissue;
 - Antlers with no meat or tissue attached;
 - Upper canine teeth, also known as buglers, whistlers, or ivories; or
 - Finished taxidermy mount.
2. The affected game management units, equivalent wildlife management units, or counties which have been designated as CWD-positive areas by the appropriate state wildlife agency, which have had free roaming deer, elk or moose diagnosed with chronic wasting disease, shall be available through the appropriate wildlife agencies or through the CWD Alliance website (www.cwd-info.org).
3. Nonresidents of {insert state name} transporting harvested cervids from affected areas across or through {insert state name} are exempt if they:
 - Do not leave any part of the carcass in {insert state name}, except those portions identified in part (1), or
 - Do not have their animal processed in {insert state name}.

REFERENCES

Angers, RC, SR Browning, TS Seward, CJ Sigurdson, MW Miller, EA Hoover, GC Telling. Prions in skeletal muscles of deer with chronic wasting disease. Available from:

<http://www.sciencemag.org/cgi/content/abstract/1122864v1>

Miller MW, Williams ES, Hobbs NT, Wolfe LL. Environmental sources of prion transmission in mule deer. *Emerging Infectious Diseases*. 2004 June. Available from:

<http://www.cdc.gov/ncidod/EID/vol10no6/04-0010.htm>

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