



## **Best Management Practices for Deer Processors and Taxidermists: Reducing the Risk of CWD Transmission and Contamination**

Chronic wasting disease (CWD) poses a serious risk to the health of Virginia's white-tailed deer population. Widely considered the most important disease threatening deer, elk, and moose in North America, CWD is always fatal and has been confirmed in at least 26 states and three Canadian provinces. Caused by an infectious protein known as a prion, CWD is very difficult to eradicate from wild populations. This is due in part to the high level of resistance exhibited by prions to environmental factors and disinfection processes. Currently, there is no strong evidence that CWD can be spread to humans, either through contact with infected animals or by eating the meat of infected animals. Research in this area is on-going, and until additional information dictates otherwise, the Centers for Disease Prevention and Control (CDC) encourages hunters not to consume meat from animals known to be infected with CWD.

**The objectives of this document are to provide taxidermists and deer processors best management practices to:**

- 1.) Minimize risk of prion contamination of equipment and venison**
- 2.) Reduce risk of CWD transmission to wild deer**

**Disclaimer:** Reference in this document to any specific commercial product, process, or service, or the use of any trade, firm, or corporation name is for the information and convenience of the public, and does not constitute endorsement, recommendation, certification, or favoring by the Department of Game and Inland Fisheries. Persons using such products and services assume responsibility for their use in accordance with current directions of the manufacturer and in compliance with state and federal laws.

### **Objective #1: Minimize risk of prion contamination of equipment and venison**

#### **BEST MANAGEMENT PRACTICES FOR PROCESSING DEER**

1. Wear gloves when handling deer carcasses.
2. Process each deer individually. Do not combine meat from multiple deer.
3. Give each deer an individual identification number and properly affix that number to all venison packages containing meat from that deer to ensure that each hunter is provided venison from their deer only.
4. After processing each deer, clean and disinfect all work surfaces and equipment to prevent prion spread.
5. Avoid cutting through bone, brain, lymph nodes, or the spinal cord.
  - i. Bone out muscles along the backbone to avoid cutting the spinal column.
  - ii. Avoid cutting through lymph nodes and remove them from meat when found.

- iii. If the spinal cord must be severed (e.g., to remove the head), use a blade or knife dedicated solely for that purpose. Do not use this blade or knife to cut muscle.

### **BEST MANAGEMENT PRACTICES FOR TAXIDERMIST PRACTICES**

1. Wear gloves when handling deer carcasses.
2. After preparing each deer, clean and disinfect all work surfaces and equipment to prevent prion spread.
3. When removing the brain and associated membranes, avoid excess handling of these tissues. Place directly into a garbage bag to avoid contaminating work surfaces. Double bag these tissues and discard in a landfill.

### **BEST MANAGEMENT PRACTICES FOR CLEANING AND DISINFECTING EQUIPMENT**

Prions are unique infectious agents that demonstrate great resistance to traditional disinfection methods. No single disinfection method is reported to be 100% effective against prions, but alkaline products are reported to be more effective than acidic or neutral agents. Proper treatment of equipment or work surfaces demands a two-step process. The first step (cleaning) results in the removal of potentially contaminated organic material (blood, tissue, etc.). The second step (disinfection) aims to de-activate, as much as possible, any remaining prions. Prions are known to be able to bind to stainless steel and the cleaning and disinfection processes may damage the surface of stainless steel, which is specially designed to prevent pitting and discoloration. Therefore it is recommended that stainless steel surfaces and equipment be treated with passivating compounds on a regular basis to help maintain its protective layer.

#### **Non-porous surfaces (plastic or metal tables, floors, etc.) and equipment (knives, scalpels, scissors, jaw spreaders, saws, etc.)**

1. **Clean:** Scrub all equipment and surfaces with a detergent. Remove all organic material (blood, tissue, etc.). The best detergent to use is one that has been scientifically determined to exhibit some activity against prions, such as:
  - a. 1.5% CIP 150® Chlorinated Alkaline Detergent (verified to remove a significant amount of prions from contaminated surfaces and demonstrated a degradative effect on prions).
  - b. Tergazyme™ (activity reported against prions).
  - c. Prolystica® 2 x Alkaline Detergent.Other detergents that have not have been scientifically proven to be effective at deactivating prions but are able to remove organic debris and tissues from a surface include:
  - a. Dish soap (not effective at inactivating prions).
2. Rinse surfaces and equipment with water.
3. **Disinfect:** Once the equipment and surfaces are scrubbed clean of organic debris and rinsed of detergent, apply a disinfectant. The best disinfectant to use is one that has been scientifically determined to exhibit some activity against prions, such as:
  - a. At least 10 minute treatment (unless otherwise directed on product label) with 5% Enrivot LpH se Disinfectant® (demonstrated activity against prions).

- b. 5 minute treatment with 40% dilution of household bleach\* (inactivates CWD prions on stainless steel surfaces).
4. **Maintain:** Regularly perform maintenance, also known as passivation, of stainless steel equipment in order to protect it from pitting and discoloration caused by bleach, other harsh cleaners, and disinfectants. Numerous passivating compounds can be found via an internet search.

**\* Preparation of 40% Dilution of Household Bleach**

1. Solution should be made daily using cold water.
2. Prepare in a well ventilated area.
3. Wear proper protective equipment. Bleach can irritate mucus membranes, skin, and the respiratory system. Follow instructions on the label if exposure occurs.
4. Bleach (sodium hypochlorite) may be purchased in various concentrations, ranging from 5.25% to 8.25% (CLOROX® bleach is a 6% or approximately 20,000 ppm sodium hypochlorite solution). A 6% sodium hypochlorite product is recommended.
5. 40% bleach solution → Mix 2 parts household bleach with 3 parts water.
6. Avoid hot water, sunlight, and organic materials (blood, tissue, hair, dirt, etc.) to prevent a reduction in the disinfecting power of bleach.

**Objective #2: Reduce risk of CWD transmission to wild deer**

***Best Management Practices for Carcass Storage and Disposal***

Carcasses contaminated with prions are a potential source of infection for wild deer, therefore proper storage and disposal of deer carcass parts is essential to minimize CWD transmission to wild deer. Destruction or inactivation of prions is extremely difficult, therefore the carcass disposal methods listed here aim to reduce the activity of prions or render the prions inaccessible to wild deer.

1. Prevent scavengers (bears, raccoons, eagles, vultures, etc.) from gaining access to the deer carcass or carcass parts before properly discarding.
2. Do not feed any part of a deer carcass to domestic animals.
3. Permitted wildlife rehabilitators should avoid working as a permitted taxidermist or actively processing deer at the same location they are rehabilitating wildlife to minimize transmission of various infectious agents, including prions, from carcasses to live animals.
4. The best disposal methods convert carcass waste to a form that is unappealing to scavengers, reduces the volume of waste to a smaller, more manageable amount, and is less likely to result in environmental contamination and consequent prion uptake by plants. Examples include:
  - i. **Incineration** of deer carcasses with a minimum secondary temperature of 1000°C in an Environmental Protection Agency-approved conventional incinerator, air curtain incinerator, or cement kiln with ash disposal in a licensed lined landfill.

- ii. **High-pressure alkaline hydrolysis** of carcasses using a pressurized vessel that exposes the carcass to 1 N NaOH or KOH heated to 150°C for a minimum of 3 hours followed by burial of the treated material in a licensed lined landfill.
- 5. Other acceptable disposal methods reduce the risk of environmental contamination with prions and render carcasses less unavailable to scavengers. Examples include:
  - i. **Lined landfill** disposal does not eliminate prions but transmission to wild deer is greatly minimized. Carcasses should be properly covered after delivery to the landfill to prevent scavenging. Taxidermists and deer processing facilities can contact private waste management companies about renting dumpsters with weekly or bi-weekly waste removal services. When using a dumpster, care must be taken to ensure that scavengers, predominately bears, are not able to gain access to carcasses and carcass parts in the dumpster.
  - ii. **Composting** does not inactivate all prions but research indicates that composting, if managed properly, can significantly reduce prion infectivity. Composted material that may be contaminated with prions cannot be spread on the landscape but should be deposited at a licensed lined landfill. When composting, pay attention to and control run-off. Further research into composting carcasses potentially contaminated with prions is warranted.

## References

Gillin C, and Mawdsley J (eds.). 2018. AFWA Technical Report on Best Management Practices for Surveillance, Management and Control of Chronic Wasting Disease. Association of Fish and Wildlife Agencies, Washington, D. C. 111 pp.

McDonnell G, Fichet G, Antloga K, et al. 2005. Cleaning investigations to reduce the risk of prion contamination on manufacturing surfaces and materials. *European Journal of Parenteral & Pharmaceutical Sciences*. 10:67-72.

Williams K, Hughson AG, Chesebro B, et al. 2019. Inactivation of chronic wasting disease prions using sodium hypochlorite. *PLoS ONE* 14(10): e0223659. <https://doi.org/10.1371/journal.pone.0223659>