



DISEASES OF BLACK-TAILED AND MULE DEER

Fact Sheet #11

BACKGROUND

Most diseases reported in black-tailed and mule deer have no significant population effects. However, emergence or expansion of some diseases can negatively affect populations by changing population density, distribution, sex and age composition, or nutritional status. Some bacteria, viruses, or fungi can be shared among deer, other wildlife species, domestic animals, and humans. Factors affecting disease transmission and emergence include climate, local environmental conditions, changes in virulence, animal density and distribution, habitat, human and animal (domestic and wild) interactions, deer farming, and artificially congregating deer. Prion, bacterial, and viral diseases all cause different illnesses. Artificial feeding, malnutrition, and toxins also impact deer populations.

PRION DISEASE

Chronic wasting disease is a leading disease challenge for many deer managers. This fatal infectious disease is associated with accumulations of misfolded proteins called prions and has no cure. Deer populations with a long history and high prevalence of CWD have measurable declines in population size as well as changes in the age structure, with mature males becoming less common. For more information on CWD, see: www.muledeerworkinggroup.com (Fact Sheet #39).

BACTERIAL DISEASES

Most bacterial diseases do not limit deer populations, even though some can be quite common in individual deer. Certain bacteria in the environment can enter wounds in the skin or mouth and cause necrobacillosis. This disease has multiple presentations depending where the bacteria entered: through the hooves (foot rot), through the mouth (necrotic stomatitis, calf diphtheria, necrotic laryngitis), or through the gastrointestinal tract (hepatic necrobacillosis). Infectious bacterial keratoconjunctivitis (IKC or “pinkeye”) is common in some geographic areas. Tissues surrounding the eye and the cornea become inflamed and can lead to blindness. Abscesses, usually from infected wounds, are frequently encountered in deer. They are not a management concern, but are often seen by hunters, resulting in questions about safe meat consumption. Less common bacterial infections in deer include plague, *Mycoplasma bovis*, dermatophilosis (rain rot), anthrax, caseous lymphadenitis, clostridial diseases, leptospirosis, and Johne’s disease.



Necrobacillosis causing foot rot in the hoof.

VIRAL DISEASES

Hemorrhagic diseases may be the most significant viral diseases affecting deer. They involve three viruses that kill cells lining blood vessels, resulting in edema and hemorrhage: bluetongue virus (BTV),



(Left) Foam from the nose due to fluid in the lungs (pulmonary edema). (Right) Pulmonary edema in lungs of a mule deer that died from a bluetongue virus.

epizootic hemorrhagic disease virus (EHDV), and deer adenovirus 1 (OdAdV-1). EHDV and BTV are transmitted by biting midges (*Culicoides* spp.) and OdAdV-1 is transmitted directly from deer to deer. All three viruses cause similar clinical illness. Acute infection may cause fluid in the lungs, diarrhea, and damaged blood vessels leading to death. Chronic infection with BTV and EHDV can cause lameness, rumen injury, and testicular damage followed by antler abnormalities (cactus bucks). Fibromas (also called papillomas or warts) caused by a papillomavirus are common on deer. They are highly visible; however, they are usually self-limiting with minimal concern for deer. Other viral diseases in deer include alphaherpesviruses, malignant catarrhal fever, bovine respiratory syncytial virus, parainfluenza virus 3, contagious ecthyma (orf), and bovine viral diarrhea virus. These are not usually associated with effects in deer populations; however, they are common livestock diseases.



Fibromas caused by papillomavirus are common.

ARTIFICIAL FEEDING AND DISEASE

Deer have specialized digestive systems to accommodate seasonal changes in forage availability. Rich feeds that lack appropriate seasonal nutrients can cause metabolic disorders including rumenitis and rumen acidosis, bloat, laminitis, and food impaction. These metabolic disorders predispose animals to disease that may increase due to artificial congregation over feed.



The rumen of a mule deer that died from frothy bloat caused by consuming alfalfa.

MALNUTRITION

Malnutrition is a common cause of death in deer across their range, particularly during winter and early spring in association with reduced forage quantity or quality, often exacerbated by deep snow. Starving deer are weak and often found dead, bedded in a natural position. Starving animals may have lots of parasites. Although malnutrition is often due to limited quantity of available food, the quality of forage also is important. Inadequate micronutrients, despite good access to food, and signs of mineral imbalances can be reflected in poor hair coat, hooves, antlers, bones, and overall condition.

TOXINS

The role of toxins in deer population health is poorly understood and toxin-associated diseases likely are under-reported. Toxic plants, pesticides, hormone disrupting chemicals, and other human-created substances can have negative effects on deer health and reproduction, some of which may not be immediately apparent.

CONTROL, TREATMENT, AND MANAGEMENT OF DISEASE IN POPULATIONS

Diseases in wildlife populations are difficult to manage. Population interventions such as changes in harvest levels, testing and removing affected animals, or treatments such as vaccinations can be costly and challenging to implement. Preventing disease introduction into susceptible populations is the most efficient and cost-effective method of disease management. Preventative management actions include import and transport restrictions, decontamination and sanitation protocols, development of physical barriers, and restrictions on baiting and feeding. Contact your local wildlife management office for information on how to reduce disease transmission in your hunting area.

More information can be found at www.muledeerworkinggroup.com. For more information on diseases and parasites, see: Pybus, M.J., Wood, M.E., Fox, K.A. and Munk, B.A., 2023. Diseases and Parasites. Pages 103-124 in Ecology and Management of Black-tailed and Mule Deer of North America.