An Introduction To A Few Of The Most Common Diseases Found In Mammals
Introduction

- A disease can be considered something that causes a disturbance to the normal function or structure of an animal.
- Most wildlife diseases can be assigned to the following categories: infectious, parasitic, toxic, physiological, nutritional, congenital, or degenerative.
- As wildlife managers, it is important to understand diseases because:
  1. Wild animals may serve as reservoirs or vectors for diseases that affect each other or humans.
  2. Disease often indicates problems with animal density.
  3. Diseases can cause serious losses in populations of endangered species.
  4. Diseases are just as important as food habits, population dynamics, and habitat.
Hemorrhagic Disease

- Is caused by either epizootic hemorrhagic disease (EHD) viruses or bluetongue (BT) viruses, both from the genus *Orbivirus*.
- Signs include fever, swelling of the head, neck, or tongue, and lameness.
- There are 3 forms of this disease:
  1. Peracute
  2. Acute
  3. Chronic.
# Hemorrhagic Disease

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<tr>
<th>Peracute</th>
<th>Acute</th>
<th>Chronic</th>
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<td>- Growth interruptions on the hooves.</td>
<td>- Hemorrhages or congestion in the heart, rumen, and intestines.</td>
<td>- Very rapid form of EHD</td>
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<td>- Sloughing of hoof walls.</td>
<td>- Ulcers on the dental pad, tongue, or palate</td>
<td>- Severe edema of the head, neck, tongue, and lungs.</td>
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<td>- Ulceration</td>
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Hemorrhagic Disease

- Transmission of EHD and BT occurs through biting midges of the genus *Culicoides*.
- Neither can be spread by contact.
- Outbreaks usually occur during late summer and early fall, related to the occurrence of the midge vectors.
Hemorrhagic Disease

- Hemorrhagic disease is the most important endemic infectious disease of white-tailed deer, especially in the southeast.
- Mortality rates can be as high as 50% during an outbreak.
- The relationship between this disease and deer density is still unclear, it is thought that vector abundance may be more important.
- Neither EHD or BT are infectious for humans.
This disease, also known as brain worm, is caused by the nematode, *Parelaphostrongylus tenuis*.

White-tailed deer are the normal host and often show no signs of infection.

In most other cervids (elk, moose, etc.) *P. tenuis* causes neurological problems that often lead to death.

White-tailed deer with heavy infections usually have inflammation of the cranial meninges.

Small red spots on the lungs of white-tailed deer are often associated with the first stage larvae of meningeal worm.

Lesions caused by these nematodes are often only visible through a microscope.
Meningeal Worm Life Cycle

1. Deer eat snails
2. Larvae enter snails
3. Larvae pass in the feces
4. Llamas eat the snails
5. Larvae migrate into the spinal cord
6. Larvae migrate to spinal cord
7. Adults go into dura mater of brain
8. Eggs migrate to lungs and hatch out larvae
9. Larvae are coughed up and swallowed
10. Paralysis results

MENINGEAL WORM LIFE CYCLE
Chronic Wasting Disease

- CWD is a transmissable sponiform encephalopathy that occurs in cervids. Thought to be caused by a prion.
- It was first identified in 1967.
- Species that have been affected include Rocky Mt. Elk, mule deer, black-tailed deer, and white-tailed deer.
- The most obvious sign is weight loss over time, but behavioral changes usually also occur. These include listlessness, lowering of the head, and repetitive walking in set patterns.
- Deer usually show increased drinking and urination.
What is a Prion?

- A prion is a small proteinaceous infectious particle that lacks nucleic acids (genetic materials).
- They are thought to be the cause of the diseases known as Transmissable Spongiform Encephalopathies (TSE’s).
- TSE’s are fatal degenerative disorders of the CNS.
- Prions are very resistant to conventional methods of inactivation.
- There is no effective treatment for TSE’s
Timeline for CWD in the U.S.

1967  CWD found in captive mule deer in a Colorado research facility.
1970’s Found in captive mule deer and elk in Wyoming.
1980’s Found in free ranging elk in Colorado and Wyoming.
1990 Found in free-ranging mule deer and white-tailed deer in Colorado and Wyoming.
1996 Found in captive game farm elk in SD, NE, OK, CO, MT, and Saskatchewan.
2002 Found in free ranging deer in Wisconsin, South Dakota, Colorado, New Mexico, and Illinois
2004 ?
Captive herds of deer and elk with CWD
Free-ranging herds of deer and elk with CWD
CWD Management

- One of the main tools for managing CWD is surveillance. Since the 1980’s, several states have surveyed populations looking for CWD.
- In the late 90’s a nationwide effort was initiated to better define the geographic distribution of CWD in free-ranging cervids in the U.S.
- Hunter harvest data has provided the majority of this information from these surveys.
- All states with CWD have implemented an intense management plan to eradicate the disease. (Mass harvest in quarantined areas)
- A technique termed immunohistochemistry is used to test brain tissue for presence of the prion associated with CWD.

Both the World Health Organization and the US Centers for Disease Control have stated that there is no known evidence that CWD can be transmitted to humans.
Arterial Worm or Elaeophorosis

- Is caused by the nematode *Elaeophora schneideri*.
- Deer with clinical elaeophorosis are easily recognized by facial swelling that occurs due to food impaction.
- The adult worms reside in the carotid arteries. Female worms produce microfillariae, which lodge in the capillaries of the skin (usually in the head region).
- The intermediate host is the common horsefly.
- The clinical syndrome of food impaction is often associated with older deer.
- Harvest rates that lower the age structure may reduce the occurrence of this disease.
- There is no reported risks to humans.
Liver Flukes

- The liver fluke that is found in white-tailed deer is the trematode *Fascioloides magna*.
- For the most part, liver flukes do not cause any outward signs of disease.
- Deer with massive fluke burdens (75 or more) may result in liver fibrosis and poor physical condition.
- The life cycle is complex. Deer are the final host. The main intermediate hosts are aquatic snails.
- Flukes have little affect on deer populations. The same liver fluke however, can be fatal in sheep.
- Consumption of venison from infected deer poses no risk to humans.
Cutaneous Fibromas

- Cutaneous fibromas are caused by a virus.
- Are basically hairless tumors that are found on the skin of deer. They generally range from 1/4 to more than 8 inches in diameter.
- Larger fibromas have the tendency to become infected.
- Unless they interfere sight, respiration or feeding, these tumors rarely cause problems.
- In many cases they are temporary.
- Human infection has not been reported.
- Only a larger tumor that is infected would cause a deer not to be safe for consumption.
Nasal Bots

- Nasal bots are the larvae of flies in the genus *Cephenemyia*.
- Nasal bots are not considered harmful to deer, even in rather large numbers.
- Adult flies lay an egg packet on the skin around the nose. When the packet is licked by deer, the larvae are released. Larvae migrate to the nasal passages and molt to the 3rd instar. Fully developed larvae exit the nose and pupate in the ground starting the cycle over.
- There are no reported health problems for humans.
Ticks

- 18 species of ticks have been reported from white-tailed deer.
- Clinical signs associated with heavy tick infestations include weakness, anemia, and occasionally mortality.
- Inflammation at attachment sites often causes secondary infection.
- Most tick infestations do not seriously affect deer populations.
- Some of the ticks that infest deer serve as vectors of human diseases such as Lyme disease and erichilosis.
Ticks

- Fawns are usually more susceptible to severe problems with ticks.
- In some areas, fawn mortality caused by ticks can reach as high as 30%.
Rabies

- Rabies is caused by a virus classified as a rhabdovirus.
- All mammals are susceptible to infection. In wild species it is most common in omnivores and carnivores.
- High risk species include raccoon, foxes, skunks, and bats.
- Is often classified into two forms: 1. Dumb rabies 2. Furious rabies Both lead to death
- Rabies is transmitted by the bite of an infected animal or by exposure of fresh wounds to the saliva of an infected animal.
- In the Southeastern U.S., raccoons are most often associated with rabies.
- Substantial mortality often occurs with an outbreak of rabies.
- Oral vaccines for wildlife have had some success in controlling the disease.
Rabies

- The major significance of rabies is related to its threat to humans and domestic animals.
- It has a 100% case fatality rate in humans.
- Pre-exposure vaccination is imperative for those who will be working with high-risk species.
- If you suspect that an animal has rabies, be sure to handle the situation in the proper way. (seek the help of a vet or AGFC)
Tularemia is caused by the bacterium *Francisella tularensis*.

- Clinical signs include lethargy, incoordination, and stupor.
- Animals infected with tularemia are usually easily caught by hand.
- Tularemia has been reported in over 45 species of vertebrates. It most often involves rabbits and rodents (muskrats and beavers).
- The most important route of transmission is by fleas and ticks.
- Tularemia can cause severe localized mortality in rabbits and other species.
- It is a life-threatening disease in humans. With prompt treatment, few cases are fatal.
- Human symptoms are similar to flu symptoms.
Canine Distemper

- Canine distemper is caused by a virus classified as a paramyxovirus.
- Common clinical signs include damage to respiratory and digestive tracts and eyes.
- Animals also commonly have neurologic problems, including tremors, convulsions, and chewing fits.
- It is an important disease of raccoons, foxes, ferrets and coyotes.
- The signs of distemper often cause it to be confused with rabies.
Reference