Rinderpest is a contagious disease of cattle, sheep, and goats that has also been called cattle plague.

In today’s presentation we will cover information regarding the virus that causes rinderpest and its characteristics. We will also talk about the economic impact the disease has had in the past and could have in the future. Additionally, we will talk about how it is transmitted or spread, the types of animals it affects and the disease in animals (clinical signs). Finally, we will address prevention and control measures for the disease as well as actions to take if rinderpest is suspected.

Let’s begin by discussing the cause of rinderpest.

This disease is caused by the rinderpest virus (RPV) which is very similar to canine distemper virus and human measles virus, two very contagious diseases. There is only one type of rinderpest virus, but field strains vary widely in severity of the disease they cause, how easily they spread between animals and what type of animals they infect. Photo (Electron photomicrograph of the rinderpest virus) from The Big Picture Book of Viruses: Paramyxoviridae accessed at www.virology.net/Big_Virology/ EM/rpv1.JPG.

Rinderpest is a threat to the U.S. because American livestock are naïve and it could have a huge economic impact.
The word “rinderpest” is German for pestilence or plague of cattle. Accounts of rinderpest virus or cattle plague date back to the siege of Troy in 1184 BC. Since that time RPV has been associated with war and movement of armies. War remained a factor in RPV spread when refugees from Iraq brought infected cattle with them into Turkey in the early 1990’s. RPV was responsible for the establishment of the first veterinary school in 1762 in Lyon, France. 1885 marked the “Great African Pandemic” which killed 80-90% of the wild ruminants; 2.5 million cattle died in South Africa alone. In the 1960’s RPV was eradicated from most of Europe, China, Russia and the Far East. 1992 saw the establishment of the Global Rinderpest Eradication Program (GREP) by the Food and Agriculture Organization of the United Nations (FAO).

Outbreaks of rinderpest can have devastating economic effects. Rinderpest is highly contagious and can destroy entire populations of cattle and buffalo. Outbreaks can lead to famine in areas where cattle are depended upon for meat, milk and draft power. An epidemic in sub-Saharan Africa in the 1980’s wiped out most of the cattle. A 1982 to 1984 outbreak in Africa caused an estimated loss of $500 million as a result of livestock losses and control measures. It is estimated that $100 million is spent annually world-wide for vaccination. (Photo: www.fao.org)

Next we will discuss where rinderpest is found and how severely it affects animals with the disease.

This series of maps from the Global Rinderpest Eradication Program (GREP), shows how well the program has worked towards eradicating rinderpest. The map in the upper left shows rinderpest endemic areas in the 1980’s, the map in the upper right is the 1990’s, and the lower center map shows the remaining foci of rinderpest in Africa in the 2000’s. GREP is designed to respond to and address all rinderpest outbreaks in order to reach the goal of complete eradication by the year 2010. Their goals and challenges are to eliminate the last foci of virus persistence, remove doubt about rinderpest persistence, persuade uncommitted countries to endorse GREP, strengthen rinderpest surveillance and emergency preparedness and to ensure cessation of unnecessary mass vaccination.
Rinderpest

Animals Affected

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- Most wild and domestic cloven-hooved animals can become infected
  - Zebu, sheep, goats, pigs and wild ungulates in contact with cattle
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  - Nasal/eye secretions
  - Feces, urine, saliva and blood
- Oral ingestion of contaminated food or water
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Rinderpest is a serious disease mainly of cattle and domestic buffalo, including water buffalo. Most wild and domestic cloven-hooved animals can become infected including zebu, sheep, goats, pigs (Asian pigs appear to be more susceptible than African or European pigs) and wild ungulates including African buffalo, elands, kudus, wildebeests, antelopes, bush pigs, warthogs, giraffes and hippos. In Africa, 13 species of game animal are naturally infected with rinderpest virus and six more species can be infected experimentally. Buffalo and wildebeest are the greatest RPV spreaders; but without reinfection from cattle, rinderpest would probably die out in wild game. (Photos: www.fao.org)

In most cases, the prognosis for rinderpest is poor. This is especially true where it occurs in previously non-infected populations and the animals have no immunity. Under these conditions, death rates can reach 100%. Animals that do recover are immune for life. In areas where the virus is present, newborn animals are protected from 6 to 11 months of age by immunity passed on from their mother. Because this immunity does not last, the most susceptible animals are the immature or young adults. (The black and white photo depicts the mass burial of animals that died from rinderpest)

Aerosol transmission of RPV occurs but only for very short distances. The most infectious period is 1 to 2 days before the onset of clinical signs and then up to 8 or 9 days after onset of clinical signs. Transmission via insect vectors is not known to occur. No chronic carrier state exists and rinderpest virus does not persist in wild populations without the presence of susceptible cattle.
The time from exposure to the development of disease (incubation period) and clinical signs vary with the strain of virus, dosage and route of exposure. Following natural exposure to the virus, the time until an animal shows illness ranges from 3 to 15 days but is usually 4 to 5 days. Clinically, RPV can occur in four different forms: the classic form, the peracute form, the subacute form, and the atypical form. (The photo depicts a cow that is unable to stand due to infection with rinderpest; source: Newsletter of the Tropical Medicine Association)
### Rinderpest

**Rinderpest in Humans**
- Rinderpest virus does not cause disease in humans

**Prevention and Control**

**Prevention**
- Do not allow any animals to leave or enter your premises
- Do not allow contact of your animals with neighbor’s livestock
  - Avoid fence line contact

**Control**
- No known treatment
- On–farm quarantine of exposed animals
- Slaughter of affected animals
- Vaccination only if directed by the authorities
- Preventative measures are key

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## Rinderpest

Rinderpest is not known to cause disease in humans.

There are various prevention and control methods that can be applied to rinderpest. These will be discussed next.

To prevent rinderpest from entering your farm, all animal movement on and off your premise must be stopped. Eliminate direct contact between animals of neighboring operations, even across fence lines.

There is no known treatment for rinderpest virus infection; this, combined with the high rates of illness, accounts for the devastating nature of the disease. As soon as an outbreak is suspected, animals that were exposed to others with rinderpest must be quarantined. Infected and exposed animals will likely be slaughtered and this can account for significant economic losses. In addition to the prevention measures on the previous slide, the use of vaccination will be decided by the proper authorities and vaccination should only be used under the direction of these authorities. Because of the lack of effective treatment, preventative measures are of key importance.

The animals and contaminated materials will need to be disposed of properly. The rinderpest virus is killed by most common disinfectants. Regular household bleach is effective and adding 2 gallons of bleach to 3 gallons of water and mixing thoroughly will provide the correct dilution. Other common disinfectants such as sodium carbonate (soda ash) and Virkon® S are effective.
Additional Resources

Internet Resources

- Center for Food Security and Public Health
  - www.cfsph.iastate.edu
- World Organization for Animal Health (OIE) website
  - www.oie.int
- USAHA Foreign Animal Diseases – “The Gray Book”
  - www.vet.uga.edu/vpp/gray_book
- Food and Agriculture Organization of the United Nations
  - www.fao.org

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