

 S
 Overview

 i
 • Organism

 i
 • Economic Impact

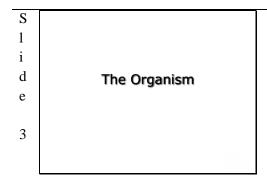
 • Epidemiology
 • Transmission

 • Clinical Signs
 • Diagnosis and Treatment

 • Diagnosis and Treatment
 • Prevention and Control

 • Actions to Take
 • Current and control

In today's presentation we will cover information regarding the organism that causes Peste des Petits Ruminants and its epidemiology. 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, the species it affects, clinical and necropsy signs seen, and diagnosis and treatment of the disease. Finally, we will address prevention and control measures for the disease, as well as actions to take if Peste des Petits ruminants is suspected.



# 1The Organismi• Family Paramyxoviridaed• Genus Morbillivirus• Closely related to rinderpest virus

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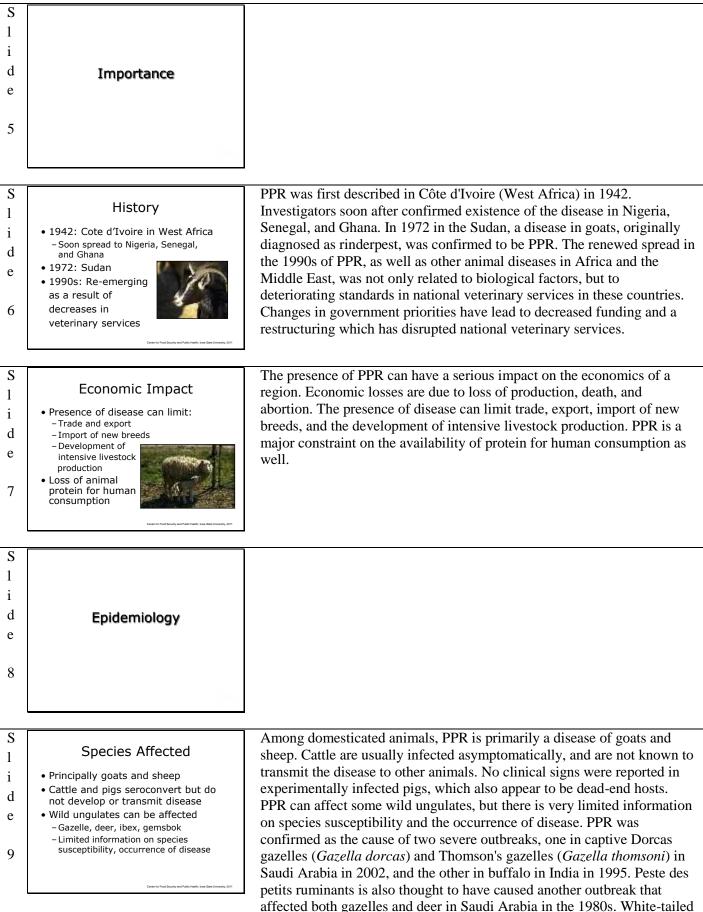
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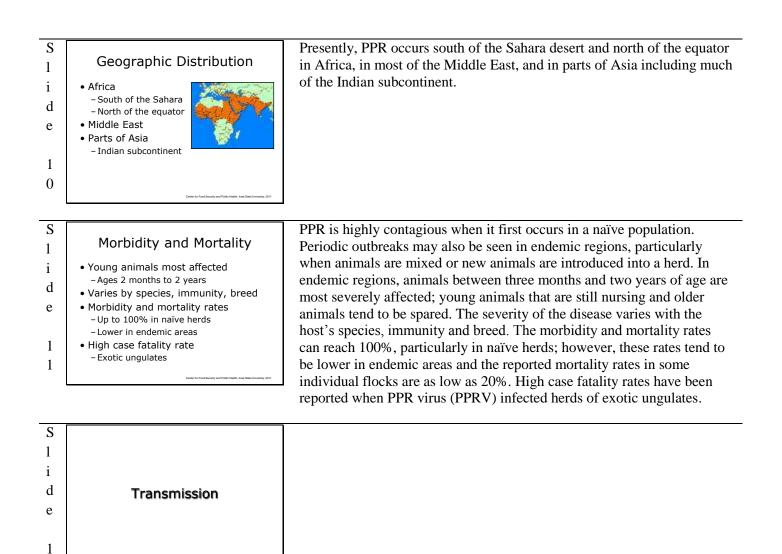
 Very similar antigenically
 Antibodies are cross-protective
 Viruses are distinct Peste des petits ruminants (PPR) is a highly contagious viral disease of goats and sheep characterized by fever, erosive stomatitis, conjunctivitis, gastroenteritis, and pneumonia. The name is French for "disastrous disease of small ruminants." Goats are usually more severely affected than sheep. PPR is caused by a paramyxovirus of the genus *Morbillivirus*. It is antigenically very similar to the rinderpest virus. For many years PPR was considered a variant of rinderpest virus, specifically adapted for goats and sheep, having lost its virulence for cattle. It is now known that the two viruses are distinct, though closely related antigenically.

(Photo: The morbillivirus that causes PPR.)

Peste des Petits Ruminants



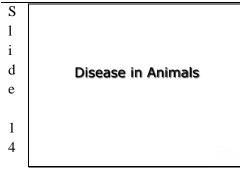
deer (Odocoileus virginianus) can be infected experimentally. In addition, peste des petits ruminants has been reported in captive Nubian ibex, Laristan sheep and gemsbok. Whether wild ruminants are important in the epidemiology of this disease is unknown.



S 1	Transmission	Transmissi thought to
i d	<ul><li>Close contact, inhalation</li><li>Virus shed in nasal and ocular</li></ul>	ocular secr Although a
e	secretions, saliva, urine, and feces <ul> <li>Long-term carriers <ul> <li>unlikely</li> </ul> </li> </ul>	recent stud
1 3	<ul> <li>Role of fomites unclear</li> <li>Do not remain infectious for long</li> </ul>	contagious troughs and not remain
		between ou

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Transmission of PPR mainly occurs during close contact. Inhalation is thought to be an important route of spread. PPRV is shed in nasal and ocular secretions, saliva, urine and feces. It probably occurs in milk. Although animals are not expected to become long-term carriers, one recent study reported that viral antigens were shed in the feces of clinically recovered goats for at least 11-12 weeks. Animals may also be contagious during the incubation stage. Fomites such as water, feed troughs and bedding can probably transmit PPRV for a short time, but do not remain infectious for long periods. How the virus is maintained between outbreaks is not well understood.



S **Clinical Signs** 1 Incubation period i - 2 to 10 days d • Peracute e Acute - High fever - Serous nasal, ocular discharge becomes 1 mucopurulent 5 - Hyperemic gums, necrotic oral lesions The incubation period can range from 2-10 days, with 2-6 days being typical. Peracute cases can be seen when PPR first occurs in naïve populations of sheep or goats. Most cases of PPR are acute. The characteristic signs area high fever and a serous nasal and ocular discharge that becomes mucopurulent. Matting is common around the eyes, and the nose may become obstructed. Within a few days of the onset of fever, the gums become hyperemic, and small, gray, necrotic foci, covering shallow erosions, begin to appear in the mouth.

#### (Photo: USDA/APHIS)



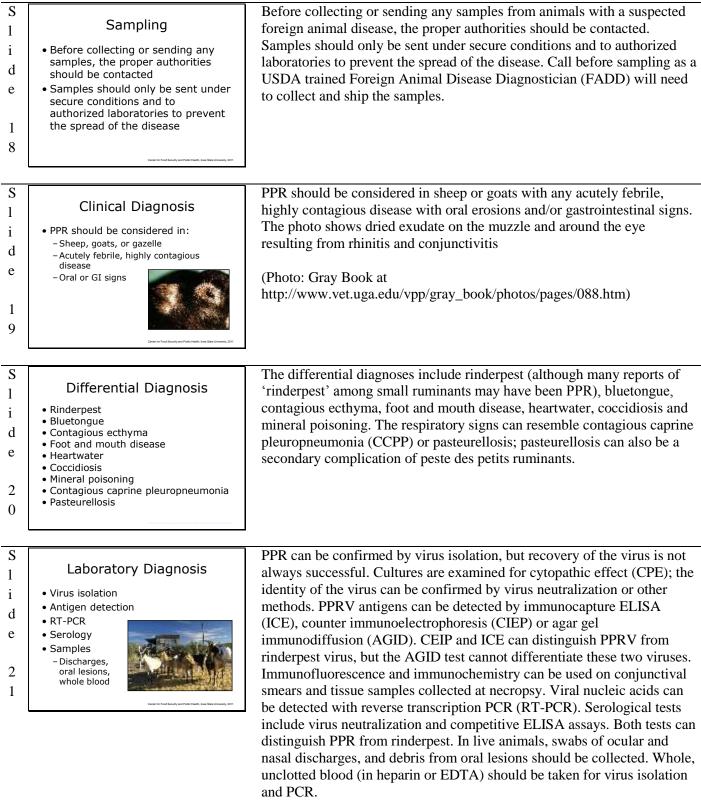
Most animals develop profuse diarrhea, which may be watery, fetid and/ or blood-stained, and sometimes contain shreds of tissue. Rapid respiration is common, and dyspnea, coughing and other signs of pneumonia may be seen. Some animals abort. In the late stages of the disease, small nodules resembling contagious ecthyma or sheep/goat pox can appear in the skin around the muzzle. The cause of these lesions is unknown. Severely affected animals become dehydrated and emaciated; hypothermia can precede death. Animals that do not die often have a prolonged convalescence. Subacute disease can also be seen in some animals; this form usually lasts 10-15 days. The symptoms are variable, but often include respiratory signs. Asymptomatic infections also occur.

### (Photo: USDA/APHIS)

<b>S</b> 1	Post Mortem Lesions
i	Inflammatory and necrotic lesions     Oral cavity
d	- GI tract
e	Emaciation     Erosive lesions     "zebra stripes"
1	• Bronchopneumonia
7	Enlarged lymph nodes

Post mortem lesions are similar to rinderpest, with inflammatory and necrotic lesions in the oral cavity and throughout the GI tract. The carcass is generally emaciated. The most severe lesions are seen in the large intestine, with congestion and "zebra stripes" of congestion on the mucosal folds of the posterior colon (top photo). Erosive lesions may also occur in the vulva and vaginal mucous membranes. Bronchopneumonia with consolidation and atelectasis occurs frequently. Congestion and enlargement of the spleen may be seen. The lymph nodes are generally congested, enlarged, and edematous.

(Photo: USDA/APHIS – bottom photo shows pneumonia, top photo shows zebra striping on intestine.)



S I d e 2	Treatment <ul> <li>No specific treatment</li> <li>Drugs to control bacterial and parasitic complications <ul> <li>May decrease mortality</li> <li>Supportive care</li> </ul> </li> </ul>	There is no specific treatment for PPR. However, drugs that control bacterial and parasitic complications, as well as supportive care, may decrease mortality.
2 2 S	Centr for Flast Secondy and Public Hearth, Issue State University, 2011	PPRV does not infect humans.
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i		
d	Disease in Humans	
e	Humans are not affected	
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3		
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1	Prevention and Control	
e		
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S [		If you suspect a case of PPR, state or federal authorities should be
l	Recommended Actions	notified immediately. Animals suspected with PPR should be isolated,
i	IMMEDIATELY notify authorities	and the farm should be quarantined until definitive diagnosis is
d	<ul> <li>Federal         <ul> <li>Area Veterinarian in Charge (AVIC)</li> </ul> </li> </ul>	determined.
e	http://www.aphis.usda.gov/animal_health/area_offices/   State  - State veterinarian	
2	www.usaha.org/stateanimalhealthofficials.aspx • Quarantine	
5	Centrol fruid Scotly on Plate Halls, box See Unional, 2011	
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S	Prevention and Control	PPR can be eradicated with a combination of quarantines, movement controls, euthanasia of infected and exposed animals, and cleaning and
	Quarantine	disinfection of infected premises. Methods that have been successfully
4	Movement controls	applied for rinderpest eradication would be appropriate for PPR.
d e	<ul> <li>Euthanasia of infected and exposed animals</li> <li>Cleaning and disinfection of infected</li> </ul>	
_	<ul> <li>Cleaning and disinfection of infected premises</li> </ul>	
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S 1 i d e 2 7	<ul> <li><b>Vaccination</b></li> <li>Outbreaks <ul> <li>Ring vaccination, high-risk populations</li> <li>Endemic areas</li> <li>Used to control disease</li> <li>Vaccine types</li> <li>Attenuated rinderpest vaccine</li> <li>Homologous, attenuated PPR vaccine</li> <li>Recombinant vaccine</li> </ul></li></ul>	In an outbreak, ring vaccination and/or vaccination of high-risk populations can be helpful. PPR is controlled in endemic areas by vaccination. An attenuated tissue culture rinderpest vaccine was used previously. However, a homologous PPR vaccine is now available and endorsed for use in countries that have followed the 'OIE pathway' for epidemiological surveillance for rinderpest; this vaccine gives strong immunity and can eliminate confusion during serological surveillance for rinderpest. A recombinant capripox-based PPR vaccine, able to protect against both capripox and PPR, is also in development.
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#### Disinfection • PPR virus killed by most common disinfectants - Alkalis (sodium carbonate, hydroxide) - Halogens (sodium hypochlorite) • 2% for 24 hours - Phenolic compounds - Citric Acid

- Alcohols

- Iodophores

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The rapid inactivation of PPRV in the environment aids eradication; this virus is thought to remain viable for less than four days outside the animal. PPRV can be inactivated by many disinfectants including alkalis (sodium carbonate, sodium hydroxide), halogens (sodium hypochlorite), phenolic compounds, citric acid, alcohols and iodophores.

5 1	Additional Resources
i	<ul> <li>World Organization for Animal Health (OIE)</li> </ul>
d	<ul> <li>www.oie.int</li> <li>U.S. Department of Agriculture (USDA)</li> <li>www.aphis.usda.gov</li> </ul>
e	<ul> <li>Center for Food Security and Public Health         – www.cfsph.iastate.edu</li> </ul>
2	<ul> <li>USAHA Foreign Animal Diseases ("The Gray Book")</li> <li>http://www.aphis.usda.gov/emergency_respon se/downloads/nahems/fad.pdf</li> </ul>
9	Center for Food Security and Rubic Health, loss Steas University, 2011

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 0 Everther Security Comito Sornsin, BA; Katle Spaulding, BS; Kerry Leedom Larson, DVM, MPH, 2000