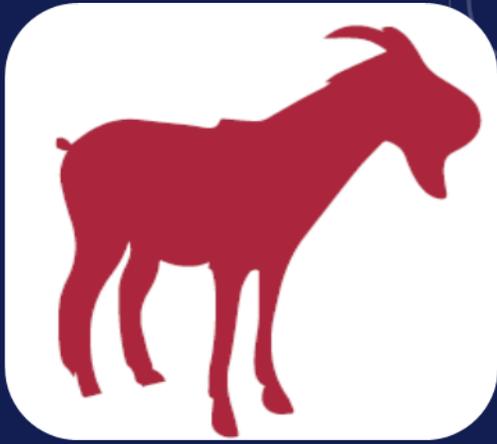


The background features a dark blue gradient with faint, light-colored technical diagrams. On the left side, there is a large circular scale with numerical markings from 140 to 260 in increments of 10. Several circular diagrams with arrows and dashed lines are scattered across the background, suggesting a technical or scientific theme.

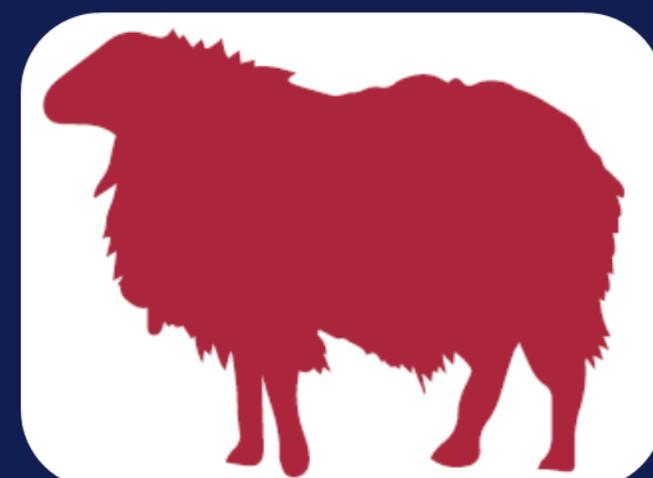
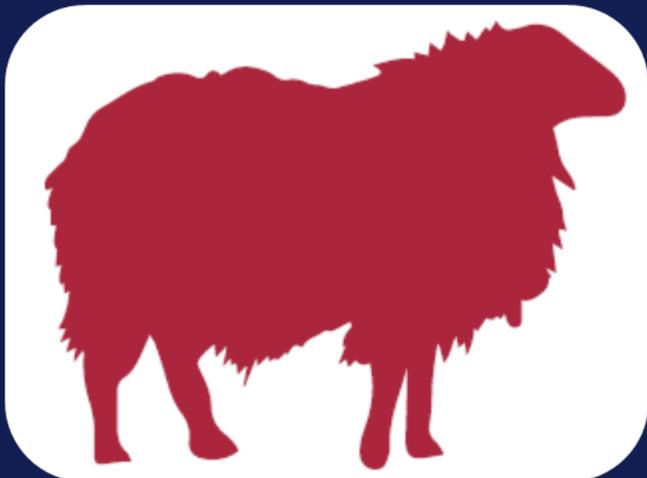
PESTE DES PETITS RUMINANT

VMC 321

**DR MANOJ KUMAR
ASSISTANT PROFESSOR**



Peste des Petits Ruminants Virus





WHAT IS PESTE DES PETITS RUMINANTS (PPR)?

PESTE DES PETITS RUMINANTS (PPR), ALSO KNOWN AS 'GOAT PLAGUE', IS A VIRAL DISEASE OF GOATS AND SHEEP CHARACTERIZED BY FEVER, SORES IN THE MOUTH, DIARRHEA, PNEUMONIA, AND SOMETIMES DEATH.

Synonyms

- Ovine rinderpest
- Kata
- Stomatitis-pneumoenteritis complex,
- Goat plague
- Pseudo-rinderpest

Official agencies such as FAO and OIE use the French name

- "Peste des Petits Ruminants",
- "Peste-des-Petits-Ruminants"
or
- "Peste-des-petits-ruminants"

The Organism

The background features a dark blue gradient with a field of small white stars. Overlaid on this are several technical diagrams: a large circular gauge with numerical markings (100, 110, 120, 130, 140, 150, 160, 170, 180, 190, 200, 210) and arrows in the top right; a smaller circular diagram with concentric lines and arrows in the bottom right; and a partial circular diagram with an arrow in the bottom left. A faint circular diagram is also visible in the top left.

CLASSIFICATION OF PPRV

Peste Des Petits Ruminants Virus

Classification

- Group : Group V [(-)ssRNA]
- Order : *Mononegavirales*
- Family : *Paramyxoviridae*
- Genus : *Morbillivirus*
- Species: Peste-des-petits-ruminants virus

THE ORGANISM

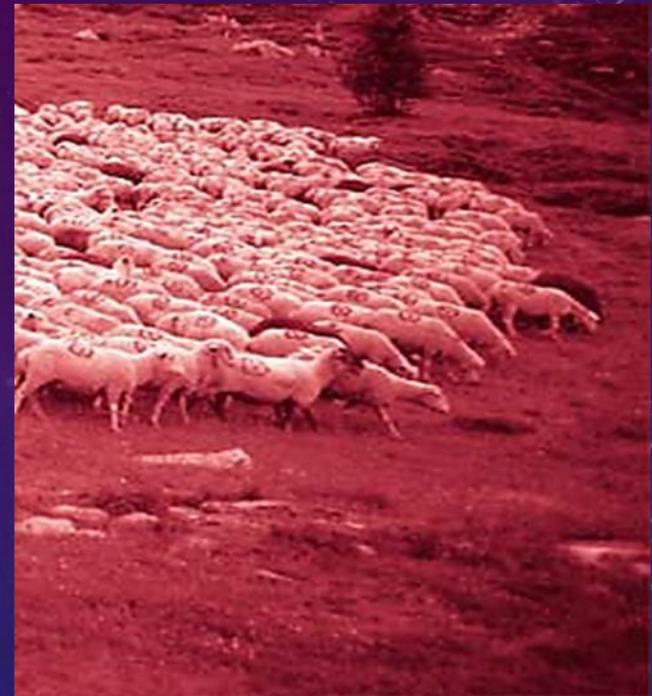
- Family Paramyxoviridae
- Genus *Morbillivirus*
- Closely related to rinderpest virus
 - Very similar antigenically
 - Antibodies are cross-protective
 - Viruses are distinct



CHARACTERISTICS:

It may:

- Survive at 60°C for 60 minutes,
- Stable from ph 4.0 to 10.0,
- Can be killed by alcohol, ether, and detergents most disinfectants
- Long survival time with chilled and frozen tissues



Importance



EPIDEMIOLOGY

- Peste des Petits Ruminants is endemic in :
 - Sub-saharan Africa
 - Arabian Peninsula.
 - Middle Eastern countries
 - **India**

Morbidity as high as 100%

Mortality can be 90%

HISTORY



**PPR was first described in Côte d'Ivoire (West Africa) in 1942.
In India , PPR was reported for the first time in 1987 at Chennai**





PPR

HOST

- Principally goats and sheep
- Cattle and pigs seroconvert but do not develop or transmit disease
- Wild ungulates can be affected
 - Gazelle, deer, ibex, gemsbok
 - Limited information on species susceptibility, occurrence of disease



MORBIDITY AND MORTALITY

- Young animals most affected
 - Ages 2 months to 2 years
- Varies by species, immunity, breed
- Morbidity and mortality rates
 - Up to 100% in naïve herds
 - Lower in endemic areas
- High case fatality rate
 - Exotic ungulates

Transmission

The background features a dark blue gradient with a field of small white stars. Overlaid on this are several technical diagrams in a lighter blue color. On the right side, there is a large circular gauge with concentric rings and numerical markings from 0 to 210. Below it is a smaller circular diagram with dashed lines and arrows. In the bottom left corner, there is another circular diagram with dashed lines and arrows. At the top center, there is a small circular diagram with a dashed line and an arrow.

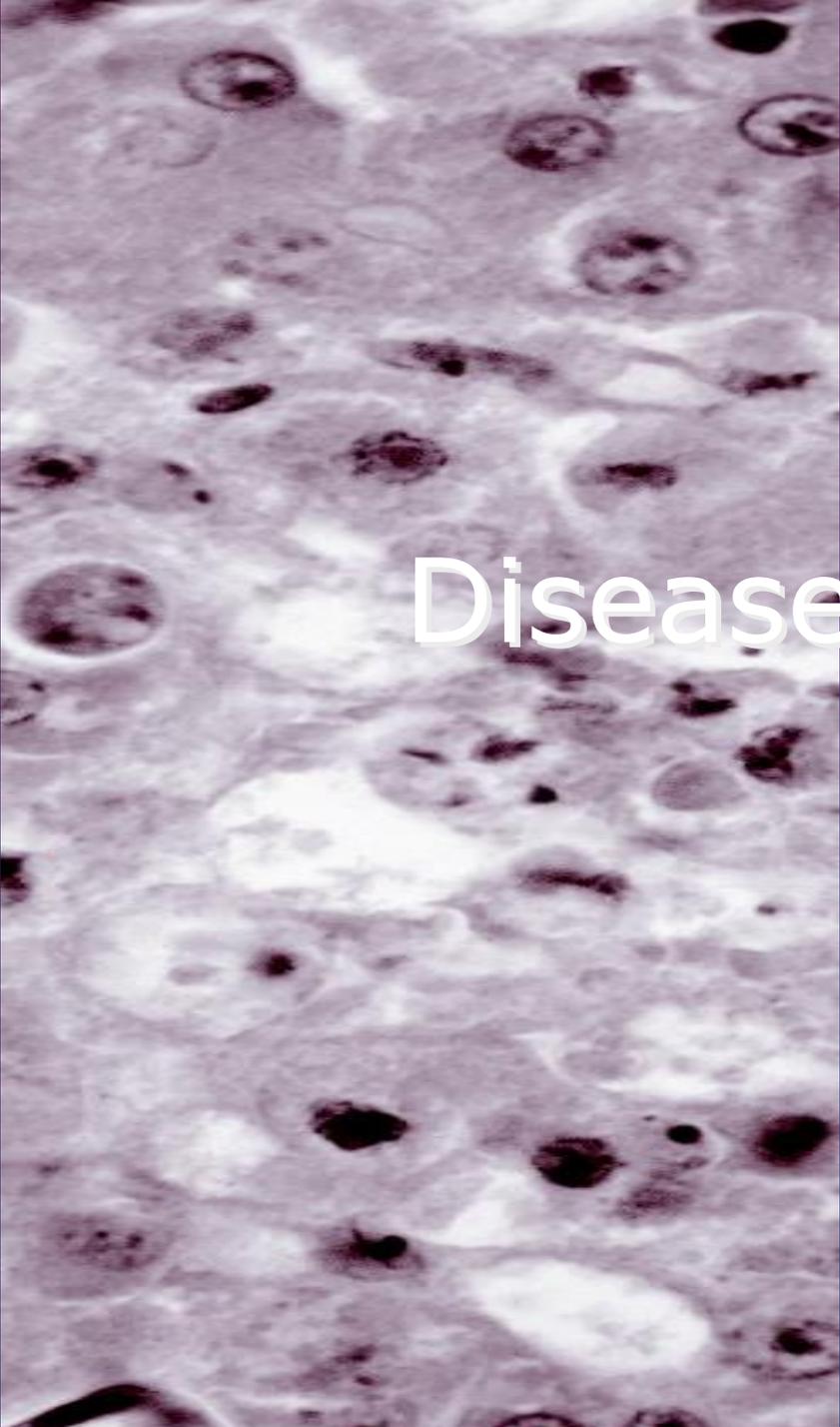
TRANSMISSION

- Close contact, inhalation
- Virus shed in nasal and ocular secretions, saliva, urine, and feces
- Long-term carriers unlikely
- Role of fomites unclear
 - Do not remain infectious for long

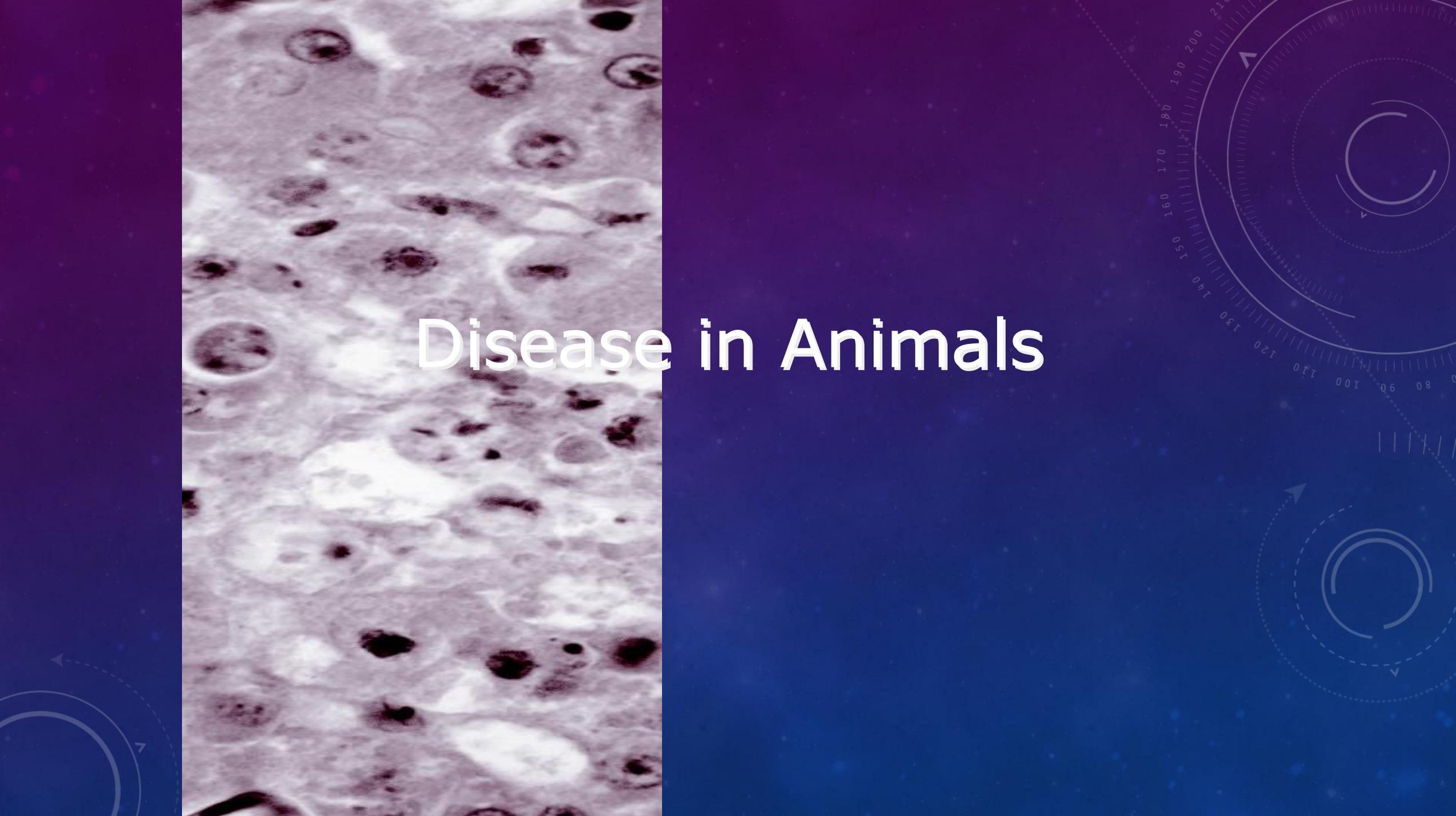
- Sick goats and sheep generate aerosols containing infective droplets.



- Close contact between sick and healthy animals

A vertical strip on the left side of the slide shows a microscopic image of tissue. The tissue is stained, and numerous dark, circular or oval spots are visible, which could be nuclei or specific cellular components. The overall texture is granular and somewhat irregular.

Disease in Animals

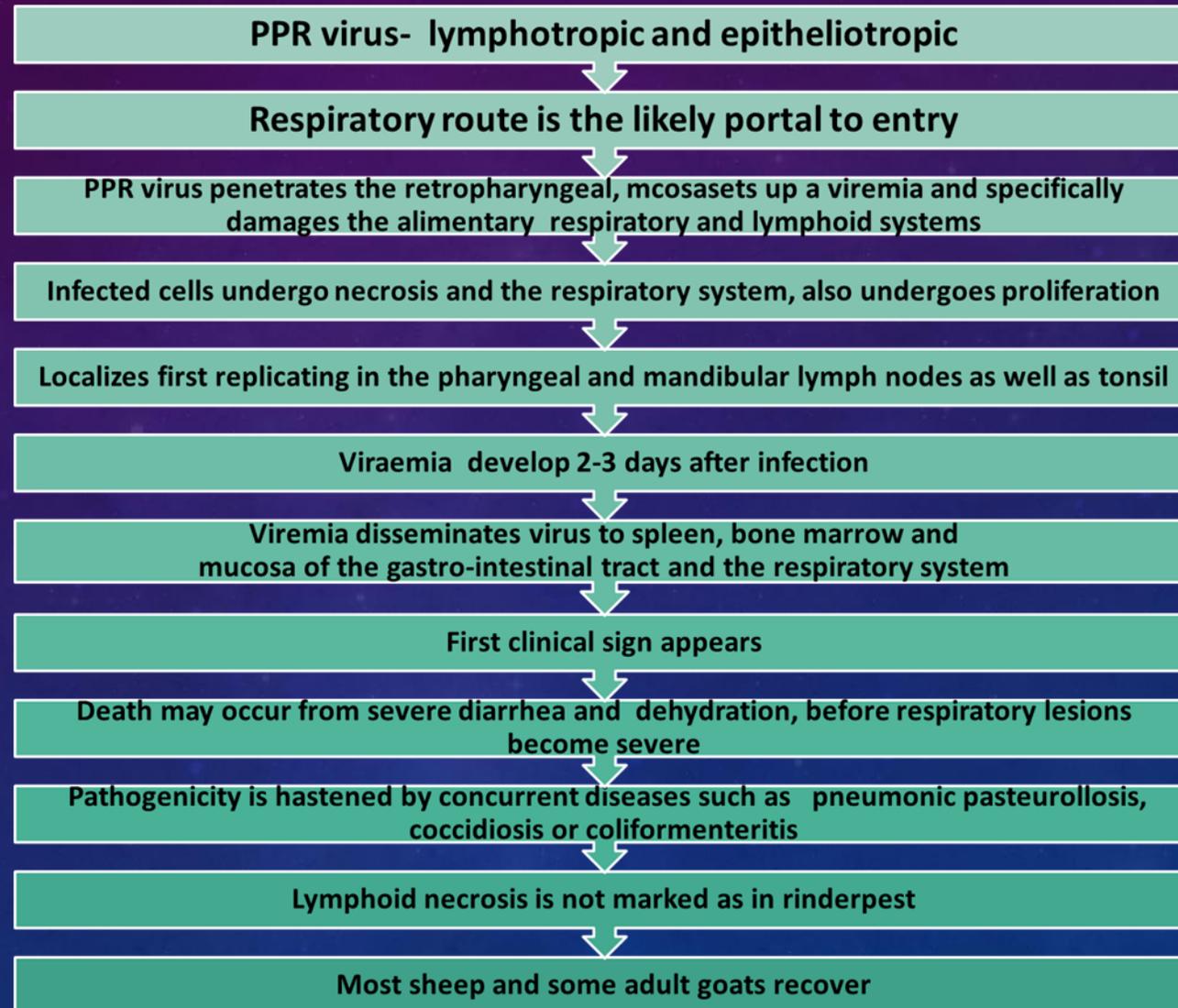
The background of the slide is a dark blue gradient. On the right side, there are several decorative circular patterns. One is a large, semi-transparent circular scale with numerical markings from 80 to 210. Below it are smaller circular motifs, some with dashed lines and arrows, suggesting a technical or scientific theme.

HOST RANGE

- Goats and sheep are the natural host
- Cattle, buffaloes, camels and pigs are susceptible to infection
 - do not exhibit clinical signs and **unable to transmit the disease** to other animals

- Route of infection is respiratory and is spread by
- airborne droplets
- secretions and excretions of infected animals
- no carrier state exists

PATHOGENESIS



CLINICAL SIGNS

- Incubation period
 - 2 to 10 days
- Peracute
- Acute
 - High fever
 - Serous nasal, ocular discharge becomes mucopurulent
 - Hyperemic gums, necrotic oral lesions

CLINICAL SIGNS

- Profuse diarrhea
 - Dehydration
 - Emaciation
- Rapid respiration, dyspnea
- Abortion
- Skin nodules around muzzle
- Subacute, asymptomatic disease

SAMPLING

- Before collecting or sending any samples, the **proper authorities should be contacted**
- Samples should only be sent **under secure conditions** and to **authorized laboratories** to prevent the spread of the disease

CLINICAL DIAGNOSIS

- PPR should be considered in:
 - Sheep, goats, or gazelle
 - Acutely febrile, highly contagious disease
 - Oral or GI signs



DIFFERENTIAL DIAGNOSIS

- Rinderpest
- Bluetongue
- Contagious ecthyma
- Foot and mouth disease
- Heartwater
- Coccidiosis
- Mineral poisoning
- Contagious caprine pleuropneumonia
- Pasteurellosis

LABORATORY DIAGNOSIS

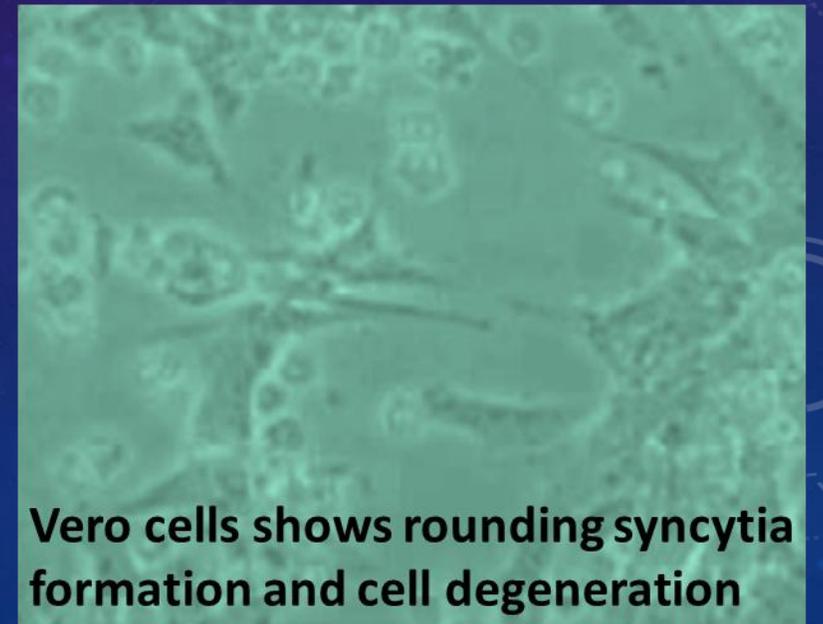
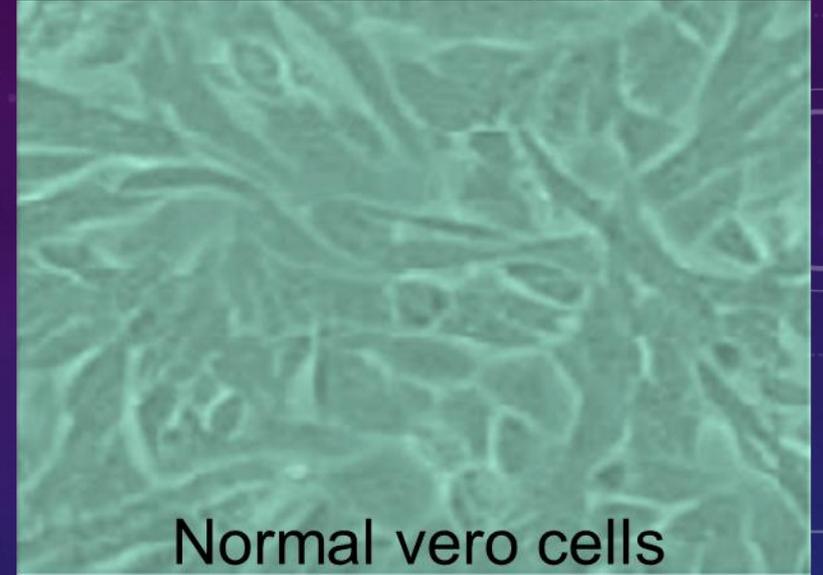
- Virus isolation
- Antigen detection
- Serology
- RT-PCR

ISOLATION AND IDENTIFICATION OF PPRV

- Samples to be taken for isolation
 - nasal swabs
 - spleen
 - Heart
 - Discharges,
 - oral lesions,
 - whole blood
- **Isolation medium** - Vero cells
primary lamb kidney & lung cells

IDENTIFICATION OF PPRV

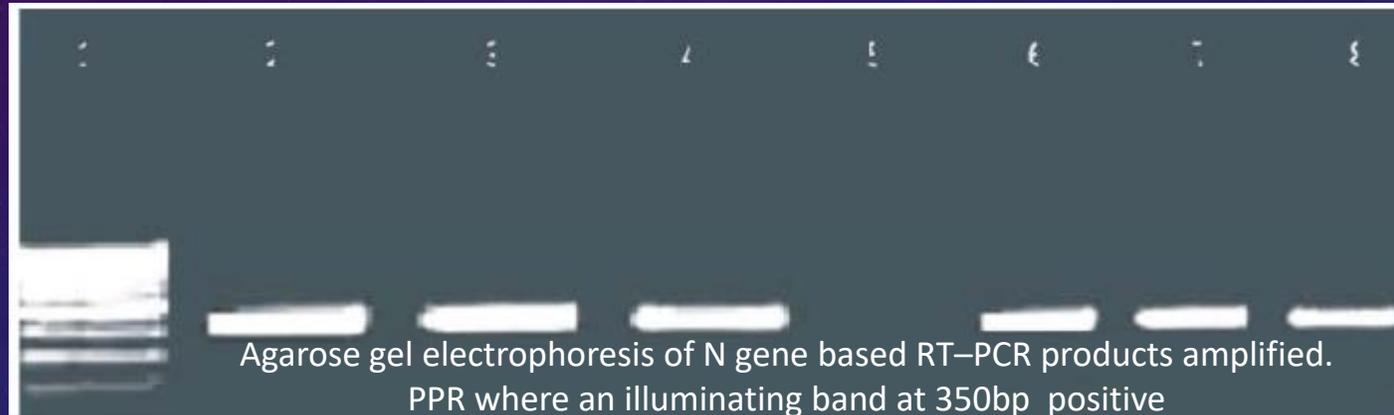
- I. CPE was characterised initially by rounding and ballooning of cells
- II. later—on aggregation of cells followed by formation of fusion mass and syncytia



SEROLOGICAL TEST

- The sandwich ELISA using monoclonal antibody (4G6) directed against an epitope of nucleoprotein of PPR virus
- Haemagglutination inhibition (HI) test
- Agar gel immunodiffusion
- Counter immunoelectrophoresis

DETECTION OF VIRAL RNA



TEST FOR THE DIAGNOSIS OF PESTE DES PETITS RUMINANTS AND THEIR PURPOSE

Method	Purpose				
	Population freedom from infection	Individual animal freedom from infection	Confirmation of clinical cases	Prevalence of infection – surveillance	Immune status in individual animals or populations post-vaccination
Competitive ELISA	++	++	–	+++	+++
Virus neutralisation	+++	+++	–	+++	+++
RT-PCR	–	–	+++	–	–
Real-time RT-PCR (QRT-PCR)	–	–	+++	–	–
Virus isolation in cell culture	–	–	++	–	–
Immunocapture ELISA	–	–	+++	–	–
Agar gel immunodiffusion	–	–	+	–	+
Counter immunoelectrophoresis	–	–	+	–	–

Prevention and Control

The background features a dark blue gradient with a subtle pattern of white stars and faint technical diagrams. On the right side, there are several circular gauges or dials with numerical scales (e.g., 100, 110, 120, 130, 140, 150, 160, 170, 180, 190, 200, 210) and arrows. Some of these diagrams are partially cut off by the edge of the frame. The overall aesthetic is clean, modern, and technical.

PREVENTION AND CONTROL

- Quarantine
- Movement controls
- Euthanasia of infected and exposed animals
- Cleaning and disinfection of infected premises

VACCINATION

- Outbreaks
 - Ring vaccination, high-risk populations
- Endemic areas
 - Used to control disease
- Vaccine types
 - Attenuated rinderpest vaccine
 - Homologous, attenuated PPR vaccine
 - Recombinant vaccine

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