

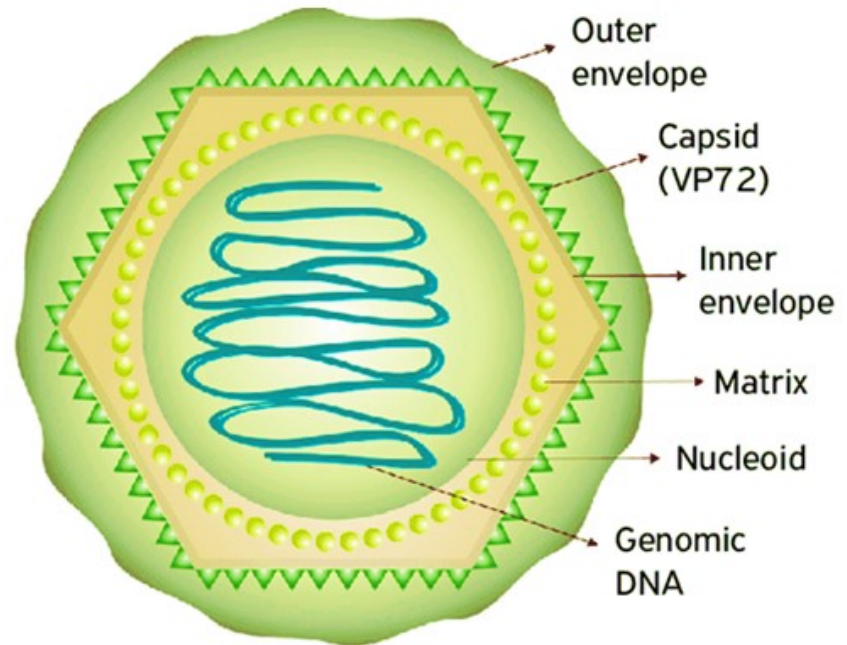


VMC 321: Systematic Veterinary Virology
African Horse Sickness Virus

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Morphology

- Virion is non-enveloped
- About 70 nm in diameter.
- Consists of a two-layered icosahedral capsid composed of 32 capsomeres
- Genome comprises of 10 double-stranded ribonucleic acid (RNA)
- Core particle comprises two major proteins, VP3 and VP7 and three minor proteins, VP1, VP4, and VP6.
- These proteins make up the group-specific epitopes
- Outer capsid (composed of two proteins, VP2 and VP5).



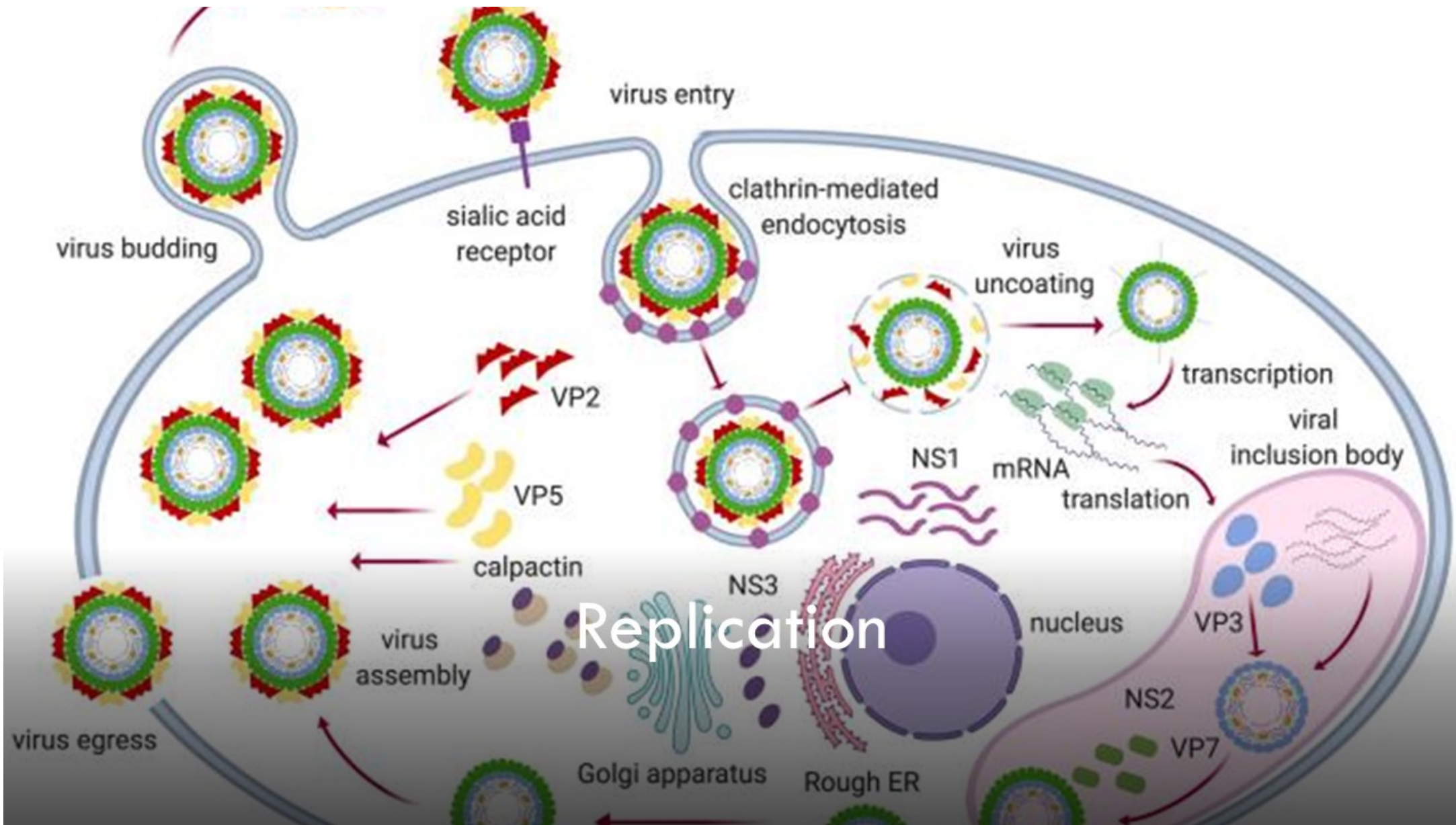
Antigenicity


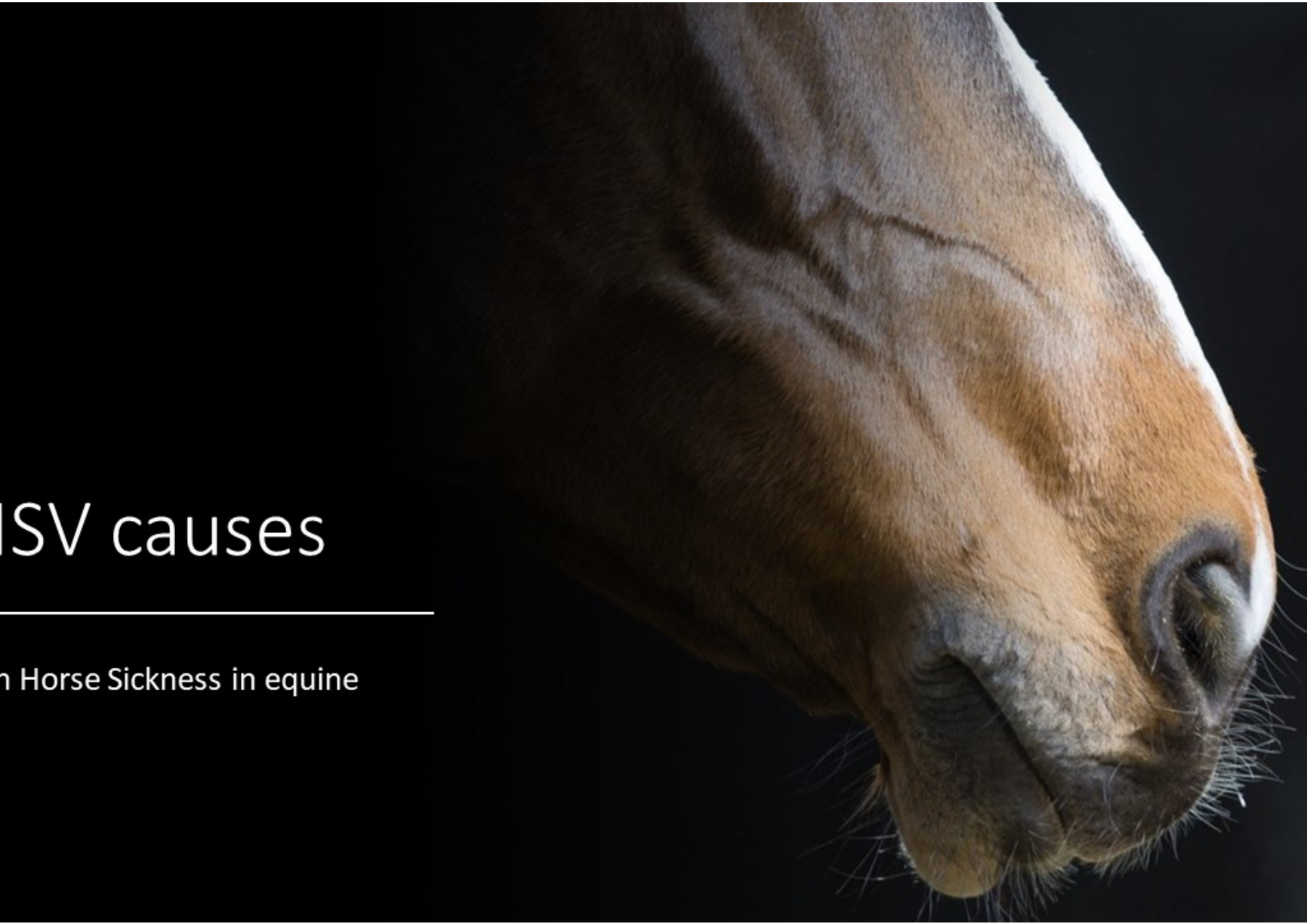
1

VP2 IS THE PROTEIN
RESPONSIBLE FOR ANTIGENIC
VARIATION

2

NINE ANTIGENICALLY DISTINCT
SEROTYPES HAVE BEEN
DESCRIBED





AHSV causes

African Horse Sickness in equine

Host



Horses



Zebra



Donkeys



mules

Other occasional host



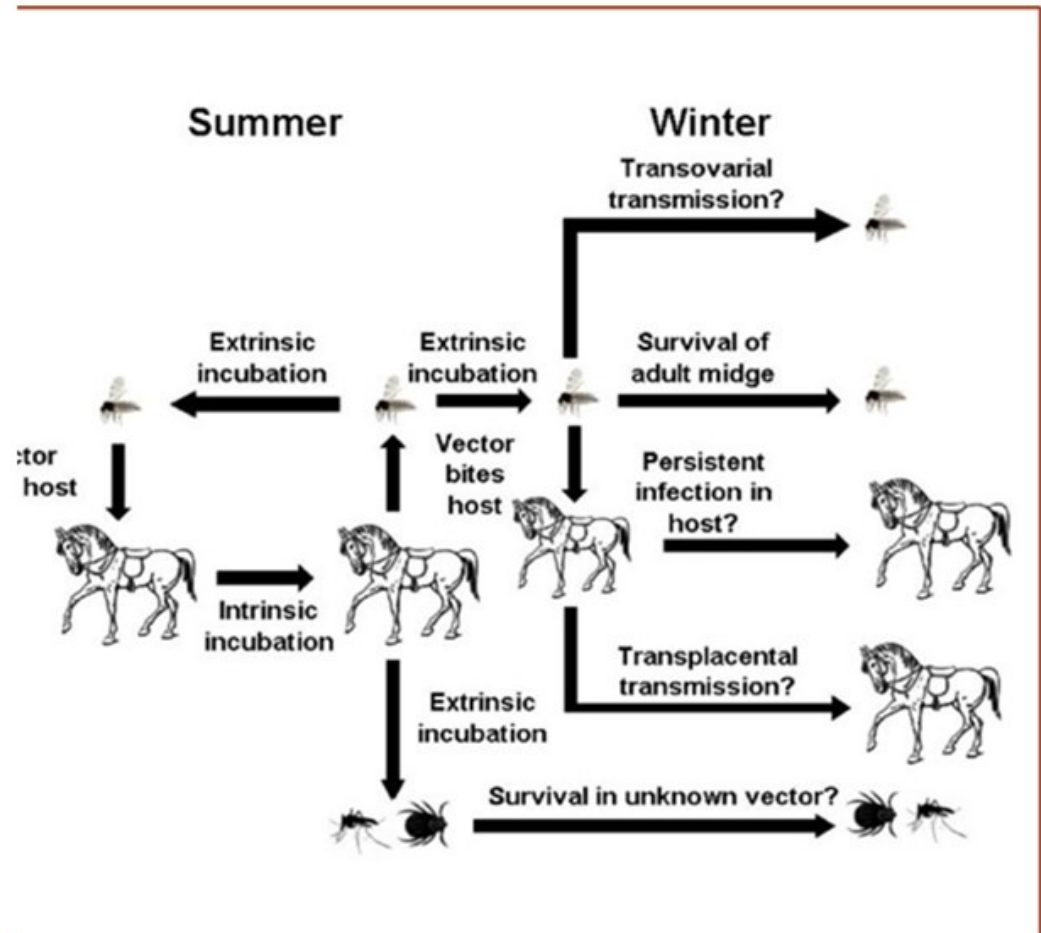
ZEBRAS, WHICH ARE OFTEN ASYMPTOMATIC, ARE THOUGHT TO BE THE NATURAL RESERVOIR HOSTS



OTHER OCCASIONAL HOSTS INCLUDE ELEPHANTS, CAMELS, AND DOGS.

Transmission

- AHSV is biologically transmitted by female midge of the genus *culicoides* .
- Disease has a seasonal occurrence
- Its prevalence is influenced by climatic and other conditions that favor the breeding of *culicoides* spp.
- Saliva, and trauma by bites enhance infection equine host.

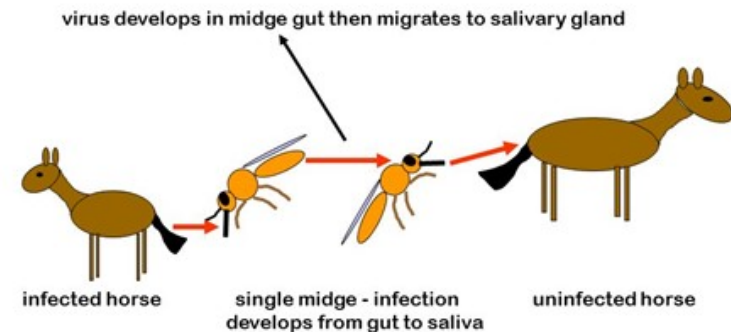


BIOLOGICAL TRANSMISSION OF AHSV

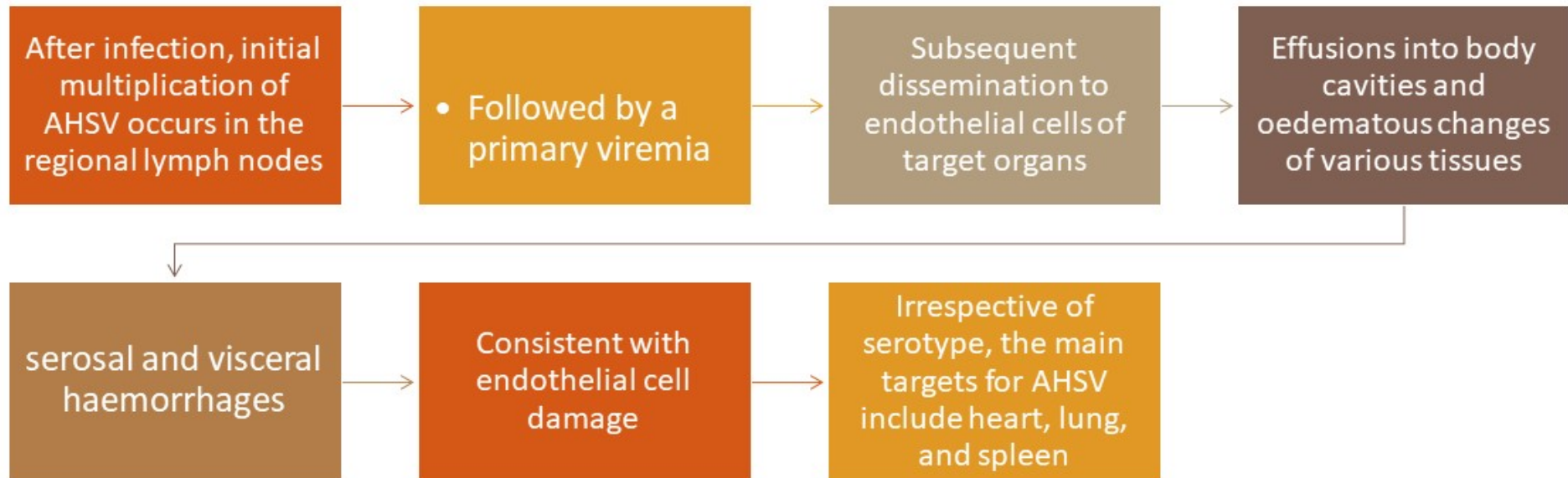
- AHSV is biologically transmitted by female midge of the genus *culicoides* spp.
- Midges are infected by feeding on viremic equines.
- Infection of salivary glands leads to virus release into saliva
- Transmission of aHSV to susceptible equines by every next blood meal.

VETERINARY PARASITES - IMPORTANCE

TRANSMISSION OF OTHER PATHOGENS eg. African horse sickness by blood feeding *Culicoides* midges



Pathogenesis



Clinical Findings

- Dunkop or Pulmonary Form
- Dikkop or Cardiac Form
- Mixed Form



Dunkop or pulmonary form

- Per acute form of AHS
- Occurs when AHSV infects fully susceptible horses.
- Rapid rise in temperature reaching up to 104° F to 106° F
- **Dunkop form** is characterized by
 - Marked and rapidly progressive respiratory failure
 - Animal tends to stand with its forelegs spread apart , head extended, & nostrils dilated.
 - Expiration is frequently forced, with the presence of abdominal heave lines.
 - Profuse sweating is common
 - Paroxysmal coughing may be observed terminally, often with frothy, serofibrinous fluid exuding from the nostrils

Dikkop or Cardiac Form

- Fever of 102° F to 106° F
- Swelling of supraorbital fossae and raising of the skin above the level of the zygomatic arch.
- Oedema of the conjunctiva , lips, cheeks, tongue, intermandibular space, and laryngeal region
- Oedema of neck , chest, obliterated jugular groove.



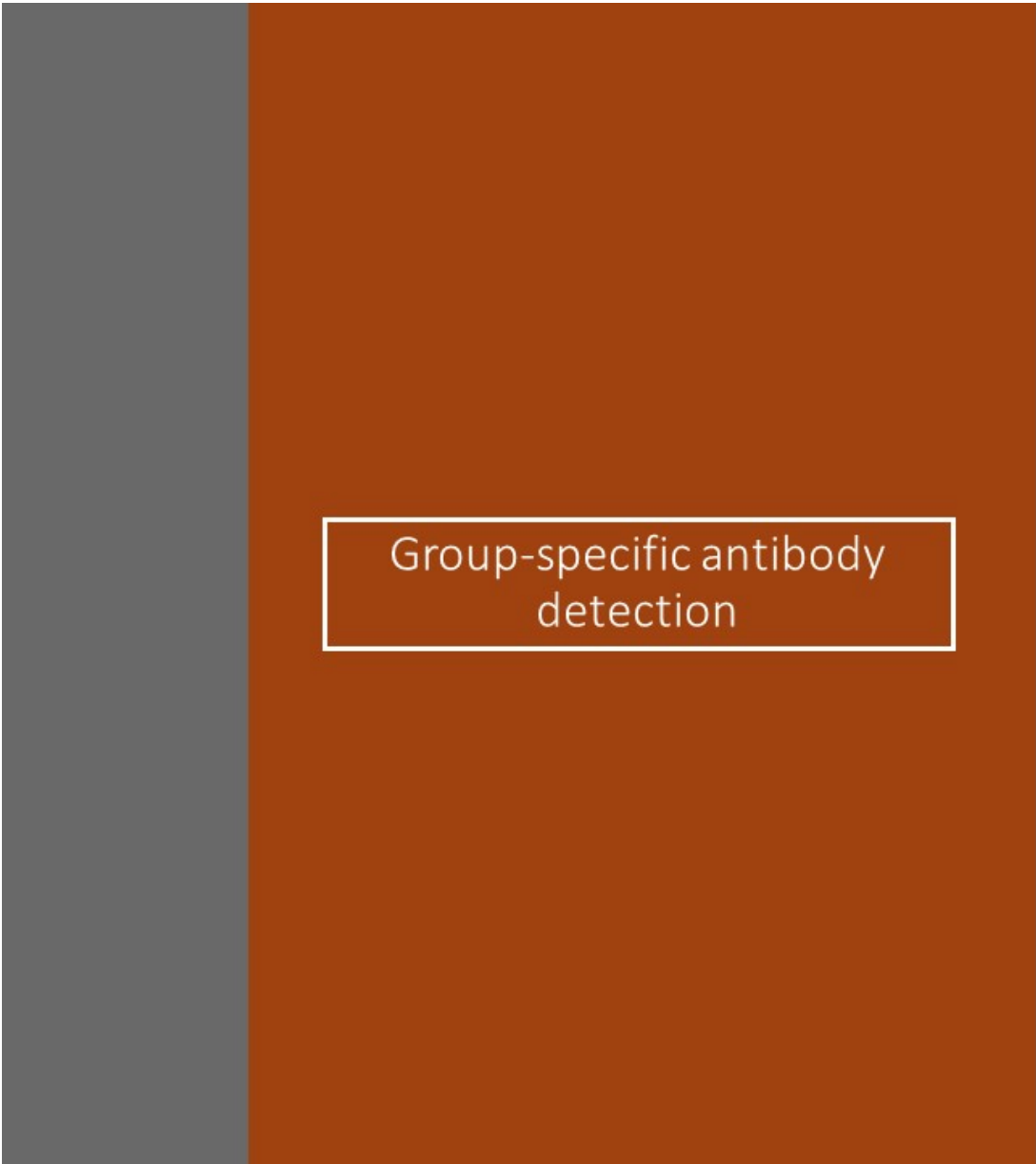
Mixed form

- most common form of AHS-
 - Initial pulmonary signs that are mild and not progressive
 - followed by edematous swelling and effusions, and death results from cardiac failure.
 - More often, the subclinical cardiac form is suddenly followed by marked dyspnea and other signs typical of the pulmonary form.
 - Death usually occurs 3 to 6 days after the onset of the febrile reaction.



Diagnosis

- Clinical findings
- Primary virus isolation in cell cultures (BHK21, Vero, or MS cells)
- intracerebral inoculation of suckling mice
- Antigen enzyme-linked immunosorbent assays (ELISAs)
- Polymerase chain reaction (PCR) to detect AHSV in blood and tissues.
- Serotyping of AHSV isolates is performed using virus neutralization (VN) tests



Group-specific antibody
detection

- Complement fixation test (CFT)
- Agar gel immunodiffusion (AGID)
- Indirect fluorescent antibody (IFA)
- ELISA tests

Prevention

- Vaccination is the most effective way to protect horses
- Control measures in epizootic situations include
 1. Delineation of the area of infection
 2. Strict movement controls within, into, and out of the infected area
 3. Stabling of all equids at least from dusk to dawn
 4. Insect control measures
 5. Consideration of immediate vaccination of all susceptible animals with an attenuated polyvalent vaccine
 6. Identification of all vaccinated animals
 7. Notification of the OIE about the disease outbreak

A close-up, grayscale photograph of a horse's face, focusing on the eye and the bridge of the nose. The horse's hair is dark, and its eye is dark and looking slightly down. The background is a soft, out-of-focus light gray.

Questions ???



Thank you