Royal Veterinary College
University of London

African Horse Sickness (AHS) and Equine Encephalosis (EE) in The Gambia 2007- 09

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Outline

- African Horse Sickness and Equine Encephalosis Virus
- AHS Vaccination Program 2007
- Questions raised
- 2009 Serology Survey Method
- Results
- Conclusions

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AHS and EE

- Noncontagious, infectious, insect-born diseases of equids transmitted by midges – *Culicoides spp.*
- Viral diseases – *Orbivirus* in the family Reoviridae
- Nine serotypes of AHS.
- Vaccines available for AHS – monovalent and polyvalent.

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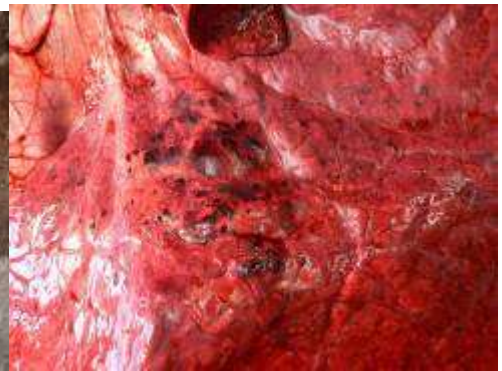
African Horse Sickness
Clinical Signs

Pulmonary Form

- Usually fatal
- Progressive respiratory failure
- RR>50bpm
- Forelegs spread, head extended and nostrils dilated
- Profuse sweating
- Paroxysmal cough – terminally frothy fluid from nostrils



Cardiac Form

- Supraorbital fossa swell.
- Oedema spreads to conjunctiva, lips, cheek , tongue.
- As swelling increase, dyspnoea and cyanosis.
- Petechiation of conjunctiva and tongue px guarded.
- Some horses show colic signs
- Mortality – 50% and slower

Pictures courtesy of Pretoria Vet School

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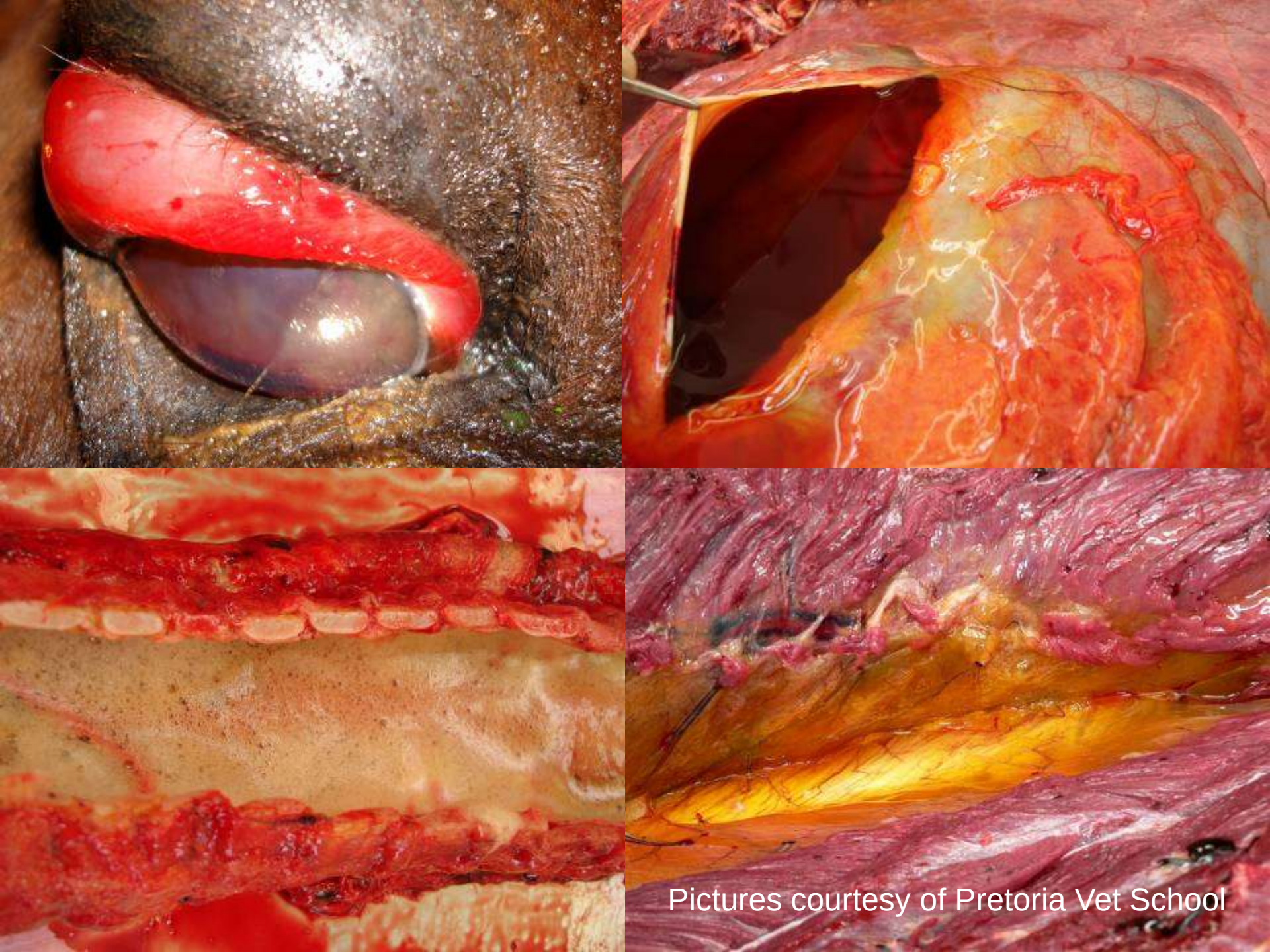
Pictures courtesy of Pretoria Vet School

Equine Encephalosis

- 90% of affected horses show no/mild clinical signs.
- Fever, increase in heart and respiratory rate
- Occ swellings of the eyelids and supraorbital fossa
- CNS, respiratory distress, abortion and cardiac failure have been reported – not reproduced experimentally
- N.B. On clinical signs alone can NOT differentiate from mild forms AHS

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North and West Africa

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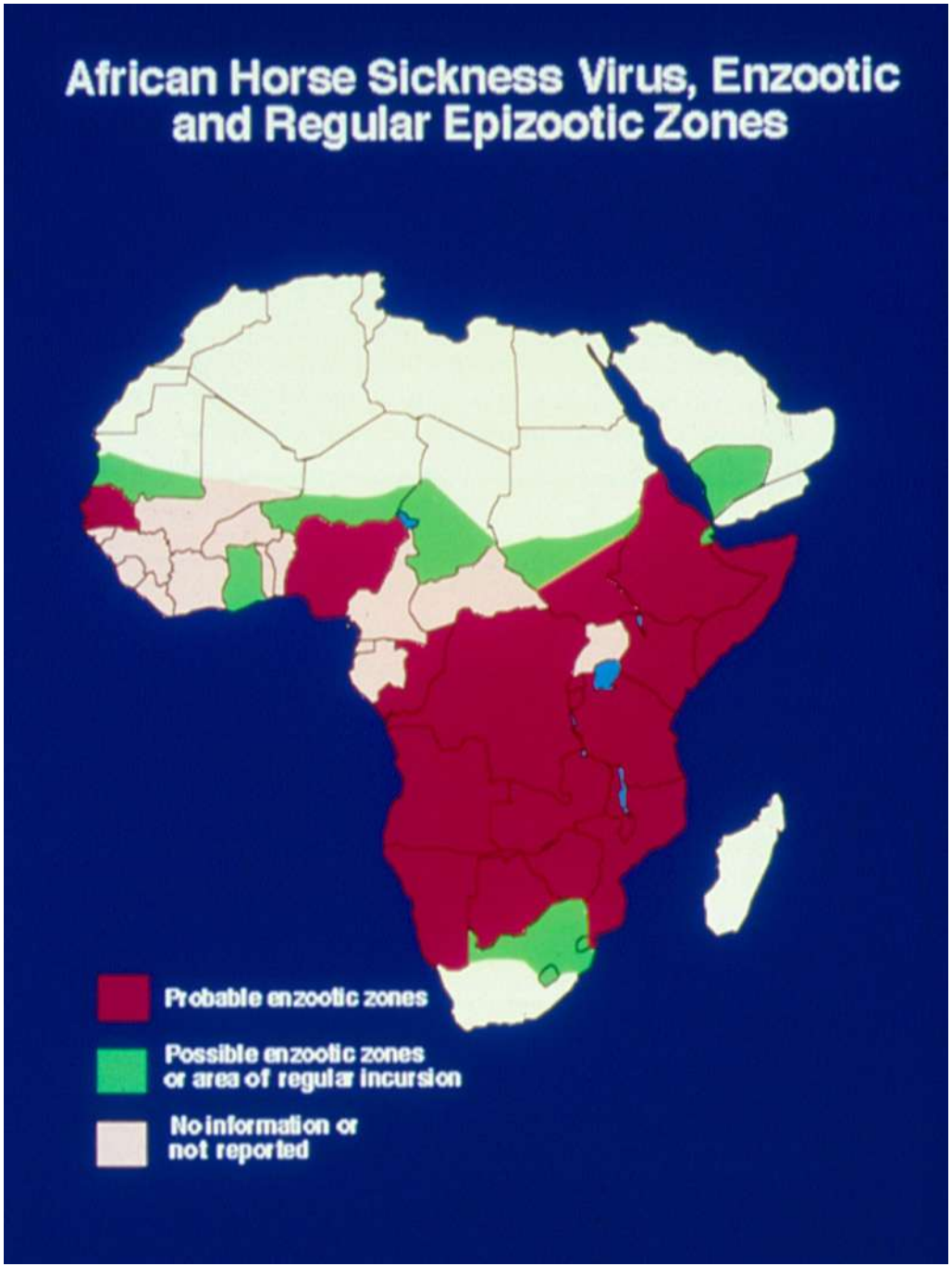

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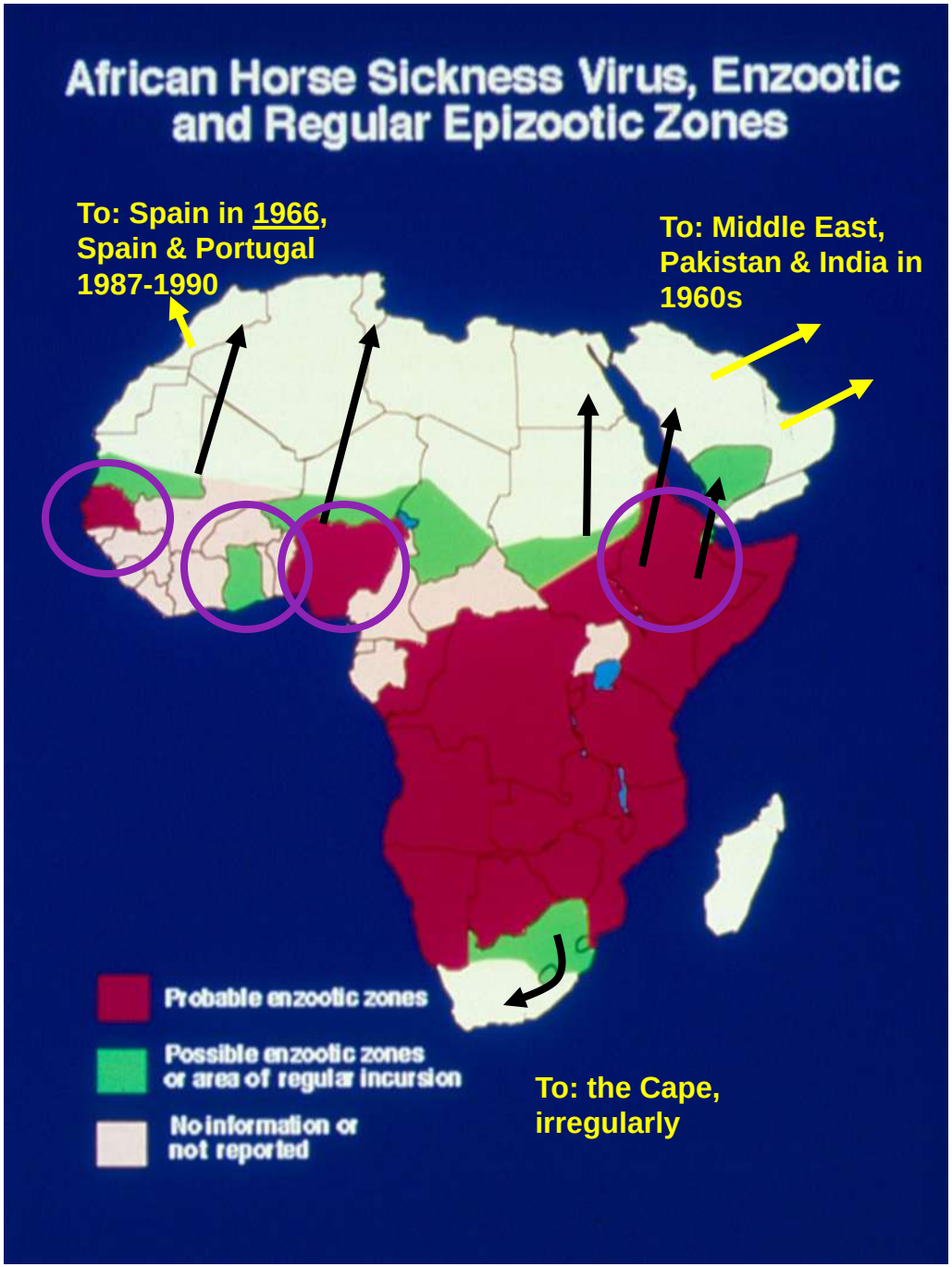

Recent outbreaks of AHS in Africa:

1. Nigeria 2007 – AHS-2
2. Senegal 2007 – AHS-2,7
3. Ethiopia 2008 – AHS -2
4. Ghana 2010 – AHS -2

South Africa – multiple serotypes circulating.

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Vaccination Campaign 2007

- Summer 2007 The Gambia suffered many deaths from horses with signs consistent with AHS.
- The Gambia Horse and Donkey Trust instigated an emergency vaccination campaign – Donkey Sanctuary, ILPH, RSPCA international and BEVA trust.
- Predominately the Senegalese monovalent AHSV-9 was used but some polyvalent vaccine was used towards the end of the outbreak.

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Vaccine


MONOEQUIPESTE
VACCIN CONTRE LA PESTE
EQUINE SEROTYPE 9
FLACON DE 2 DOSES
VOIE SOUS CUTANÉE
A CONSERVER A +4° C / 20° C
ISRA
VACCINS
USAGE VETERINAIRE
LABORATOIRE NATIONAL DE L'ELEVAGE
ET DE RECHERCHES VETERINAIRES
BP 2057 DAKAR HANN SENEGAL
LOT N° M - 0407
UTIL. AV. SEP. 2005

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Vaccination Protocol

Questions Raised?

- Was the disease truly AHS?
- If so what serotype and was one vaccine effective?
- Which areas of The Gambia were most affected?
  - North Bank vs South Bank
- Need for a serological survey was recognised
  - BEVA Trust – see BEVA website – www.beva.org.uk

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Picture courtesy of Pretoria Vet School

Serological Survey - 2009

- 122 Equids - 7 villages North of the river Gambia in the North Nianija district of mid Gambia – **Group 1**
- 22 Equids - 10 villages in the district of Fulladu from South of the river Gambia – **Control Group**
- 101 horses and 43 donkeys – Median age 7yrs (1-20)
- 22 vaccinated animals in group 1 non on control group

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Geography

Places Sampled: North Bank

22/10/2009 – Kataba Omar (30), Tanu (8), Jamally Babu (12)
23/10/2009 – Jallow Kunda (15), Njoben Tukolor (18), Kass (25), Dingirai (14)

Places Sampled: South Bank

Brikamaba Livestock Market - Fulladu
24/10/2009 – Sincha madado, Boirami, Sare Babu, Njoben, Aloulie, Fass, Brikamaba, Sare Bakaru, Kerewan Samaba Sira, Kerr Ousman Boye

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Villages

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Practicalities

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- The serum was separated from RBC and kept chilled.
- The samples were packaged according to UN3373 and stored in Banjul with kind help by MRC laboratory
- The samples were sent as UN category B pathogen to IAH.

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Laboratory Work

- Serology – looking for antibodies to the virus
- Real-time polymerase chain reaction (RT-PCR) was used for detecting live virus
- Virus isolation
- Sequence analysis of the VP-2 gene

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Results - AHSV

- 96% of both groups were seropositive to AHSV
  - 100% of control group (all unvaccinated)
  - 8 equids from group 1 were RT-PCR positive
  - Live virus was isolated from two of these sample (both unvaccinated)
  - PCR and sequence analysis showed ASHV-9.
  - Sequence is identical to Pakistan reference strain.

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Results - EEV

- 100% of both groups were seropositive for EEV
- Six donkeys in group 1 were positive on RT-PCR
  - Indicating current infection
  - In two of these samples live virus has been recovered
  - The virus is currently being serotyped and sequenced.

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Conclusions

- EEV is endemic to The Gambia
- AHS ref. strain is used to make monovalent vaccine
- Probable that monovalent live attenuated AHSV-9 vaccine is circulating in the equid population.
- Unvaccinated and vaccinated horses were seropositive and live virus was recovered from unvaccinated horses indicate live vaccine virus circulating in the midge population.

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Conclusion (2)

- This seroconveriosn to AHSV-9 is likely to protect horses against field AHSV-9.
- Young horses are being vaccinated against AHSV-9 by the vaccine spreading in the midge population.
- This transmission makes reversion to virulence more likely – must monitor but no evidence that this is case
- Will not protect against other AHSV serotypes.

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Recommendations

- Seroconverison to AHSV-9 is likely to protect against serotype 9
- Must monitor for reversion to virilence
- AHSV-2 circulating in Senegal in 2007
- West Africa – increase in serotypes
- Serotype new outbreaks – use OIE listed laboratories

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Future

- Senegalese vaccine is being DNA sequenced
- EEV is being serotyped
- What is the role of EEV?
  - Does EEV cause neurological signs?
  - Interplay with other pathogens/disease syndromes?

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One Medicine
One World

- Medical and veterinary collaboration and interplay
- International co-operation
- Collaboration between governments and NGOs
- Multi-disciplinary approach

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Acknowledgements

BEVA Trust

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Nixon Equine
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Any Questions?