



# RIFT VALLEY FEVER towards a DIAGNOSIS

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## THE POPULAR PRESS - A QUOTE

"Prior to 1977, RVF was considered to be a largely veterinary disease of bovine and ovine stock"

RVFV 1<sup>o</sup> recognised in Kenya in 1930

Aswan High Dam

- \* changed the ecology of the Nile

- \* slowed the river and prevented annual floods

1977 - 6yrs after completion of the dam

- "people epidemic" -

## How?

- Exposure to virus (abraded skin or m.m.)
- Mosquito bites



two secondary cycles



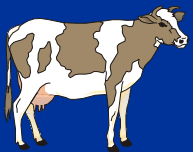
sylvatic



urban peridomestic

occupational exposure

- livestock industry
- abattoir workers (pH <6)
- ritual slaughter aerosols
- consumption raw milk



# RIFT VALLEY FEVER (RVF)

## 1. DIAGNOSTICS:-

Why do we want a diagnosis?

- and fast?



ZOONOSIS

Definition: a disease that is naturally  
transmitted between  
humans - animals



# DIAGNOSIS

A. antibody

B. antigen

A single death/abortion is confusing

Sudden onset of abortions (all stages)

Neonatal deaths - jaundice/haemorrhages

- > rainfall
- > mosquitoes
- > sustained flooding

## SUSPICION OF RVF

Human is often the sentinel  
Human amplifying host



## A - ANTIBODIES:-

Useful -  
Safe -

- Surveillance
- Early Warning
- Diagnosis (Early response d3)

IgM

IgG

Other

LAB : FIELD

# LAB TESTS

(vaccinated staff)

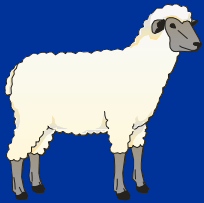
1. OTHER
  - HI hamster liver (sucrose/acetone extracted)  
T.C. antigen
  - VNT
  - AGID
  
2. IgG ELISA
  - 1984/1995 i-Elisa (whole virus)  
Se/Sp 97%
  - i-Elisa (rec. antigen)
  - Inhibition Elisa  
Se/Sp 99% (pos and neg antigen)  
> Advantages (background, spp.)
  - Sandwich Elisa similar Se/Sp

# IgG ELISA

(cont.)

i - Elisa - safe, stable and quick

- sacrifice some Se
- pre coated and pre blocked
- performs well under African conditions



3. IgM ELISA - also pre coated and pre blocked

- Capture Elisa
- Anti-species antibody to detect IgM  
(rabbit anti-sheep x ovine, bovine & caprine)
- Post infection or vaccination  
d 3/4                      >d.28

## FIELD TESTS

This is a rural disease !

A rapid "pen-side" test would be useful.

### Rapid Immunochromatographic Test

- rec. antigen
- all species (+ humans)
- blood or serum
- IgG and IgM
- Se and Sp of 100% and 97%

→ a lateral flow strip test

# RAPID

(cont.)

- Essentials
- conjugate pad with 40nm gold
  - separation pad
  - test line
  - control line

Duplicate conjugate : gold complexed antigen  
gold complexed IgY

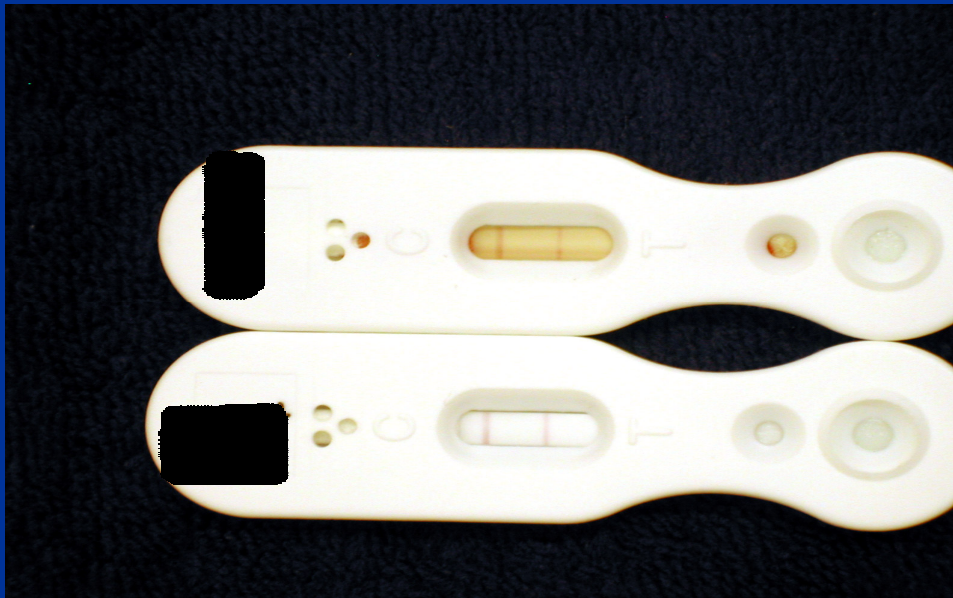
Buffers



Read after 10 mins. Max 30 mins.

# Properties

- Store & use at 4 – 30 °C
- Shelf life – 18 months
- Whole blood & serum





## B - ANTIGEN:-

Confirmatory -

Limit exposure -

- Enveloped virus
  - Relatively fragile
    - pH sensitive
      - Grows well (mouse brain, tissue culture)

## Isolation

## Histopath

## PCR

1. Isolation
  - on ice or glycerol/saline
  - liver, spleen, foetal brain (autolysis)
  - lytic in TC
  - ID with FA or PCR
2. Histopath
  - in formalin, useful for IMP staining
  - pathognomic liver lesions
3. PCR
  - test of choice
  - speed and safety
  - real-time RT-PCR (published)
  - targets glycoprotein gene G2

## FOOTNOTE

Then: suspect tissue x known positive serum

AGID

Now : battery well validated tests

choice of antibody/antigen

RVF      Diagnosis

SPEED      and      SAFETY

**Thank You**

