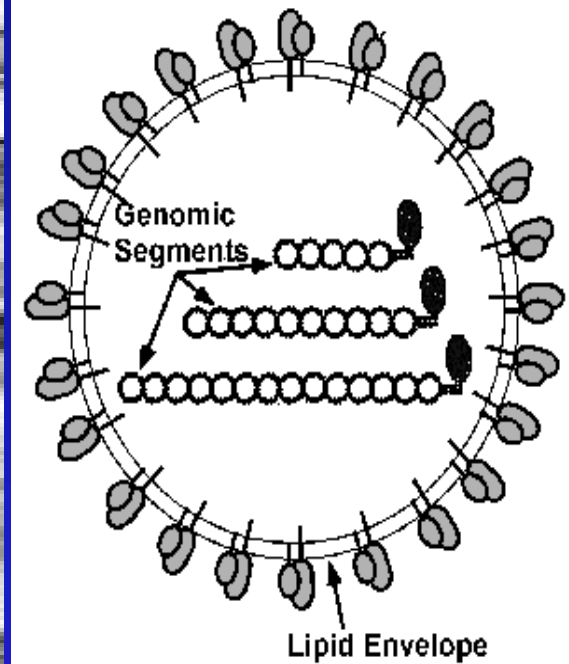
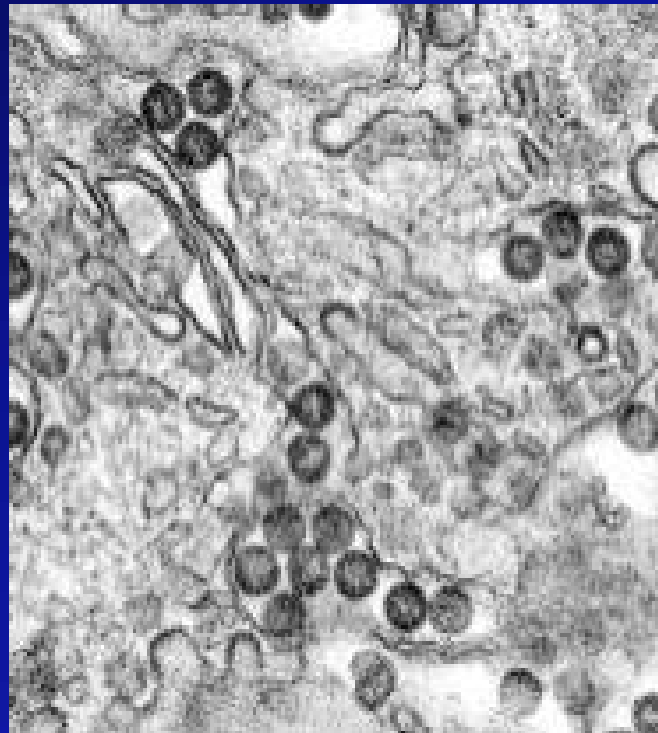
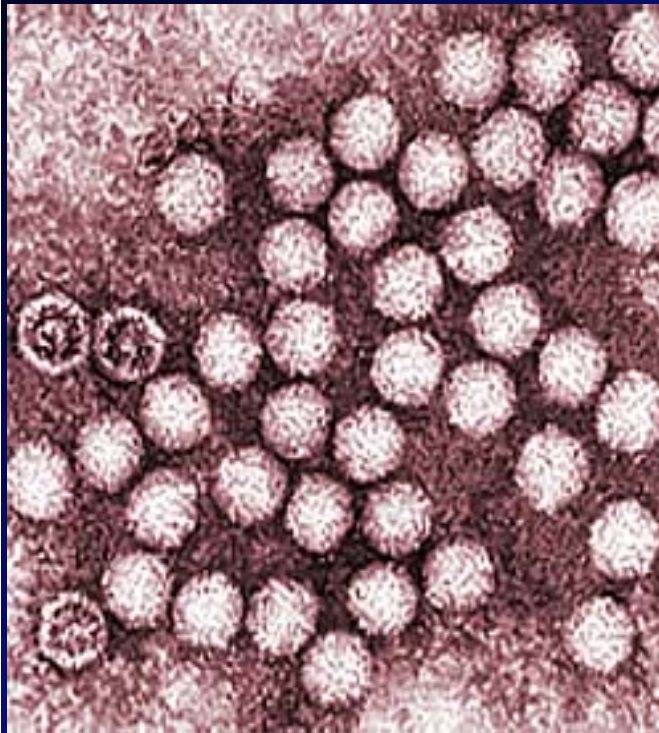


Rift Valley Fever: Diagnosis



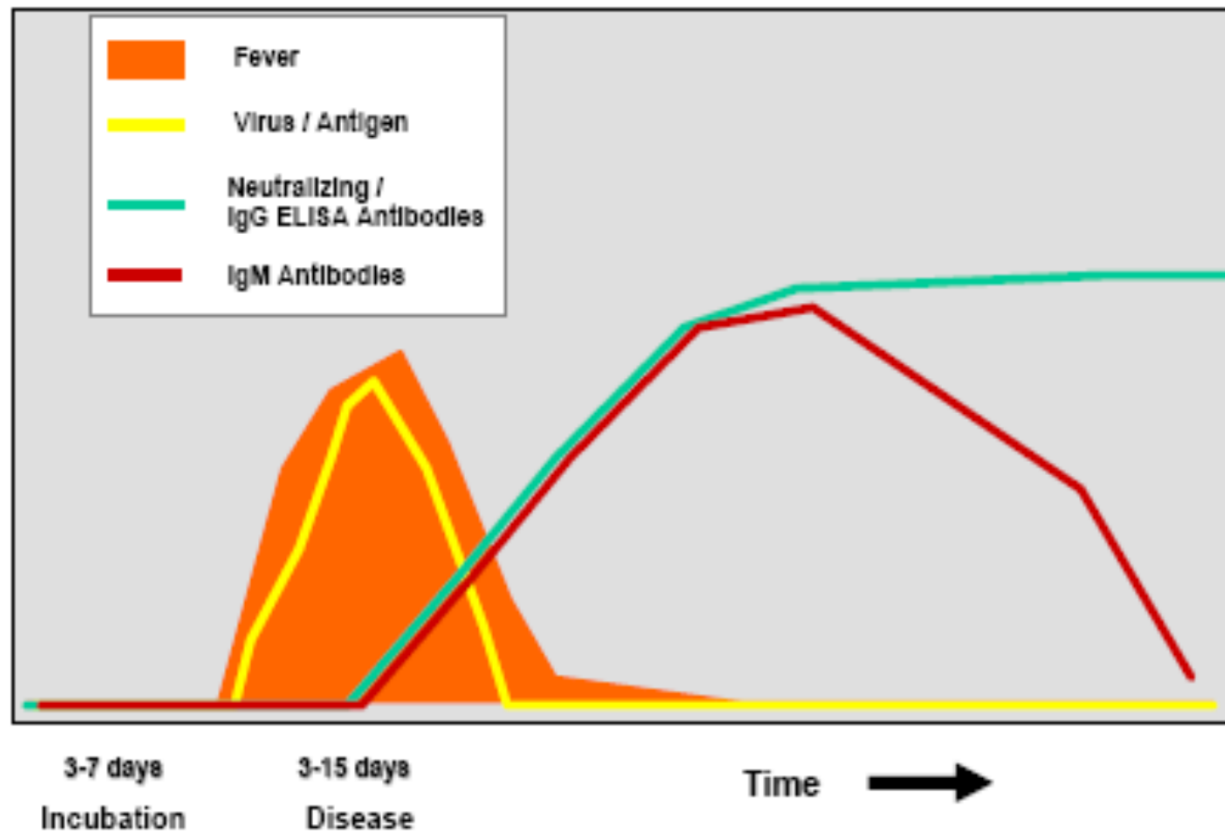
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Laboratory Diagnosis – RVF Case Confirmation

Specimen: Serum, whole blood, liver tissue, aborted fetus

Tests performed: VI, antigen ELISA, PCR, IgM ELISA, IgG ELISA, VN

RVF: short duration viraemia



Laboratory Quality Assurance

Successful diagnosis depends largely on the quality of the specimen and the transport and storage conditions of the specimen before it is processed in the laboratory

Strategies for diagnosis of RVF

Based on detection of:

✓ Live virus

✓ Viral antigens

✓ Viral nucleic acids

1 – 10 days

✓ Acute phase antibodies (IgM) } 4 – 42 days

✓ Chronic phase antibodies (IgG) } 7 - ?days

Short viremia following RVF infection

- Data shows that 10^{10} RNA copies/mL of serum in sheep and 10^8 copies/mL in cattle and humans
- At day 9 post-infection, calves no longer viremic, and RVF virus can be isolated only from the brain.

RVF Diagnosis

- during outbreak
- post-outbreak
- for routine surveillance*
- for return to trade
- sentinel animals

*For routine surveillance

- is the region endemic or RVF-free?
- has there been vaccination?

RVF Diagnosis (Endemic Region)

During outbreak and post-outbreak

- PCR, antigen and IgM
- Send samples for virus isolation
- IgG NOT useful

For returning to trade after outbreak

- PCR, antigen and IgM
- Send samples for virus isolation
- IgG NOT useful

RVF Diagnosis (Endemic Region)

For routine surveillance

- IgM, IgG for animals born in IEP
- Send samples for virus neutralization

For sentinel animals

- IgM, IgG
- Send samples for virus neutralization

RVF Diagnosis (RVF-free Region)

- IgG sufficient
- May do both IgM and IgG for confirmation
- Send samples for virus neutralization

Antibody profile in infected vs vaccinated

IgG

IgM

Infected →

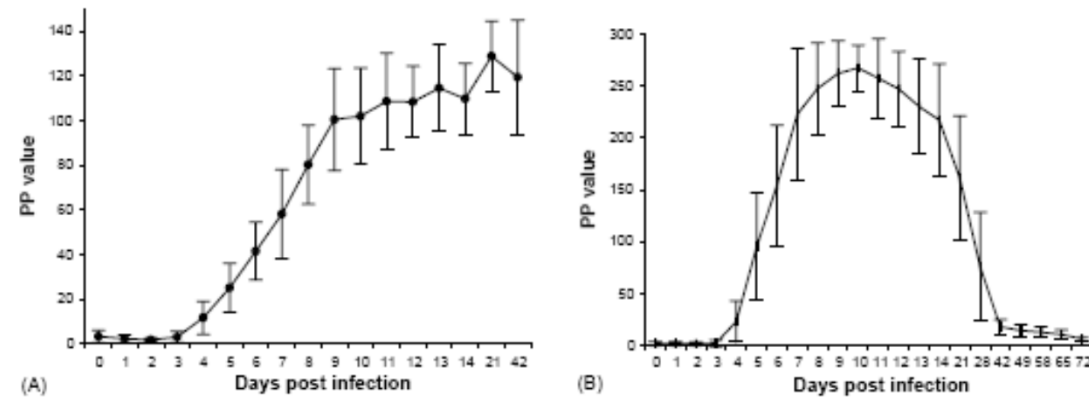


Fig. 2. Mean \pm 1 S.D. IgG (A) and IgM (B) responses in sheep ($n = 8$) infected with wild type AR 20368 strain of Rift Valley fever virus.

Vaccinated →

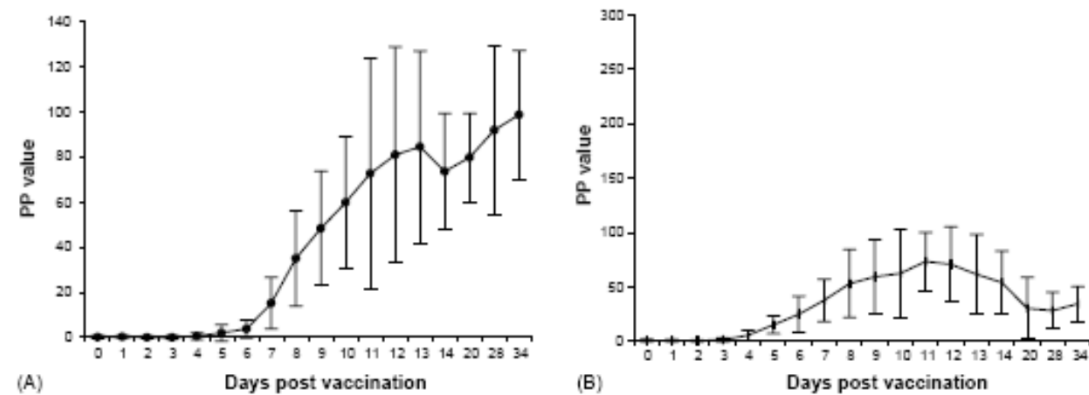


Fig. 3. Mean \pm 1 S.D. IgG (A) and IgM (B) responses in sheep ($n = 10$) vaccinated with live-attenuated Smithburn strain of Rift Valley fever virus.

RVF Seroprevalence

Domestic animals

- Cattle, sheep goat
- Camel

sandwich/indirect EIA, VN
inhibition EIA, VN

Sentinel animals

- Sheep

sandwich/indirect EIA, VN

Wildlife

- Buffalos + others

inhibition EIA, VN

Vaccination

NONE

Available test

- Commercially/Publicly:
- PCR – requires training and BL-3 lab but can be available to countries (Primer can be ordered commercially).
- From BDSL.....
 - inhibition ELISA for detecting IgG (in all species).
 - capture ELISA for IgM (in specified species, bov. capr. ovi)
 - indirect ELISA for IgG (anti-species conjugate)
 - Sandwich ELISA for IgG (in specified species, bov. capr. ovi)
- Through research links
 - CDC/USA (S. Nichol) - not available commercially
 - USDA/USA (W. Wilson) – still undergoing validation
 - NICD/RSA (J. Paweska) – most available through BDSL