

# Rift Valley Fever - 4. Clinical signs and pathology



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# Objective and themes

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## Objective and themes



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# Clinical signs in small ruminants

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Rift Valley Fever can affect numerous animal species but signs have been shown to occur mainly in ruminants and humans.

The **incubation period** varies from 1 to 6 days; 12–36 hours in lambs.

Viraemia becomes demonstrable in lambs less than 1 week old within 16 hours of infection with small doses of virus, and persists for the duration of infection ending fatally within 36-42 hours.

In older ruminants, viraemia becomes demonstrable 1-2 days post infection and persist for up to 7 days, usually being most intense on the second to fifth day.

Maximum titres recorded have been  $10^{10}$  MIPLD<sub>50</sub>/ml in lambs,  $10^7$  in adult sheep and calves,  $10^8$  in kids and  $10^5$  in adult goats.



Sheep Flock in Africa

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The clinical signs are strongly influenced by the breed and the age of the affected animals. Local indigenous African sheep breeds are usually less susceptible to the disease.

In small ruminants, RVF has been divided into **3 clinical forms**, according to the severity of the signs, as follows:

- peracute



- acute
- subacute or unapparent



Sheep flock in Africa

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**THE PERACUTE FORM**

**THE ACUTE FORM**

**THE SUBACUTE /  
UNAPPARENT FORM**

The peracute form usually occurs in young animals **less than two weeks of age**, which can show:

- biphasic fever (40–42°C); fever subsides just prior to death
- anorexia; in part due to disinclination to move
- weakness, listless
- abdominal pain
- rapid, abdominal respiration prior to death
- death within 24–36 hours

Case-fatality may approach 90%-100%.



THE PERACUTE FORM

THE ACUTE FORM

THE SUBACUTE /  
UNAPPARENT FORM

**Lambs over 2 weeks of age** and **adult sheep** are generally affected by the acute form of the disease. They can show:

- peracute disease: sudden death with no appreciable signs
- fever (41–42°C) lasting 24–96 hours
- anorexia
- weakness, listlessness and depression
- increased respiratory rate
- vomiting
- bloody/fetid diarrhoea
- mucopurulent nasal discharge
- icterus may be evident in a few animals
- in pregnant ewes, 'Abortion storms' with rates approaching 100%

Case-fatality may reach 20-30% and occurs after 24-48 hours. The entire flock may be affected.





THE PERACUTE FORM	THE ACUTE FORM	THE SUBACUTE / UNAPPARENT FORM
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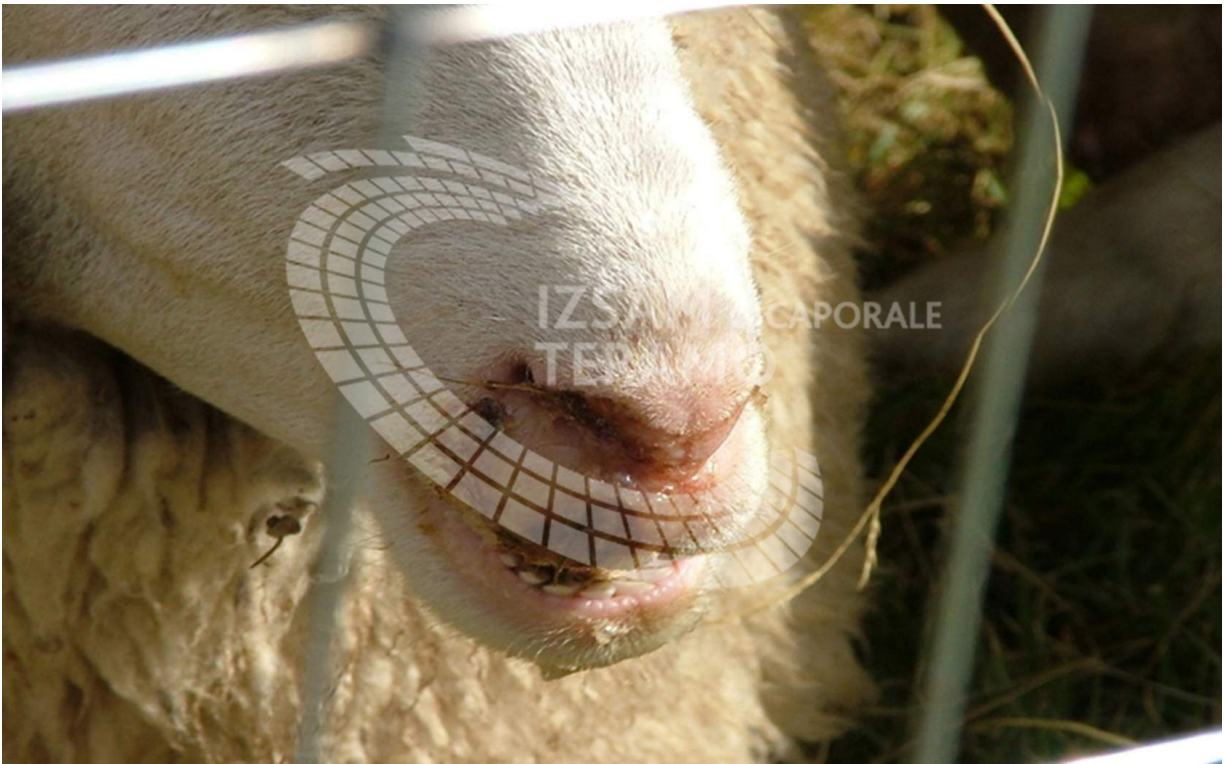
Usually this forms can be observed in **adult animals**. The clinical signs are:

- high fever (40.5-42°C) which persists for 1 to 5 days;
- anorexia;
- conjunctival congestion;
- nasal discharge;
- vomiting.

Abortion, diarrhoea and sometimes jaundice may be observed,

Case-fatality rate may reach 5%-20%.





**Older or less susceptible animals** may experience only a transient, unapparent period of fever, sometime with depression and anorexia.

What is the incubation period of RVF in lambs infected naturally?

- 
- 12-36 hours

7 days

14 days

SUBMIT





# Clinical signs in cattle and camels

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Also in cattle the severity of clinical forms can vary according to the age and the breed.

**Calves less than 10 days old** may die within 20-24 hours without apparent clinical signs.

Calves may also show:

- fever (40–41°C)
- inappetence
- weakness and depression
- bloody or fetid diarrhoea
- icterus (more evident than in lambs)

The animal may be lying prostrate on its side, with opisthotonos and respiratory distress. The course is rapid and death occurs within 48 hours. In highly susceptible breeds mortality may reach 70%.



Clinical signs in adult cattle are often unapparent, but it may include:

- fever lasting 24–96 hours
- dry and/or dull coat
- lacrimation, nasal discharge and excessive salivation
- anorexia

- weakness
- bloody/fetid diarrhoea
- fall in milk yield
- abortion rate may reach 85% in the herd

Generally, the superficial lymph nodes are swollen and lactating animals present dysgalactia, while there may be bleeding from the nose and mouth.

The fever and signs can persist for 3-10 days during which time many animals die. The mortality rate varies from 10-40%, especially in younger animals.



The prominent clinical sign in RVF infected one-humped **camels** (*Camelus dromedaries*) is mainly related to abortion storms.

However, other clinical signs were reported among camels in RVF outbreak in Mauritania, including haemorrhagic septicaemia and severe respiratory distress.

Perinatal deaths may occur in young camels during RVF outbreaks.





IZSAM  
TERAMO

Allocate the correct clinical signs observable in sheep to the peracute/acute or subacute/unapparent clinical forms:

Peracute / Acute forms

Mucopurulent nasal discharge

Partial or total anorexia

Rapid, abdominal respiration

Abortion

Subacute / Unapparent forms



Nasal discharge

Conjunctival congestion

Transient fever



# Clinical signs in humans

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Rift Valley Fever is generally causing a benign **flu-like syndrome** in humans.

After a short incubation period (3-6 days), the onset of the disease includes:

- hyperthermia;
- general malaise with anorexia;
- depression;
- dizziness.

People who have contracted RVF often have myalgia, joint pain and rigidity and sometimes suffer with diarrhoea and vomiting. The average duration of this flu-like form is approximately 1 week.



Symptoms	Frequency (%)
Fever	100
Myalgia	98
Headaches	80

Symptoms	Frequency (%)
Joint pains	43
Nausea	26
Anorexia	21
Abdominal pain	21
Vomiting	17
Constipation	14
Sore throat	8
Biphasic fever	8
Haemorrhagic manifestations	6
Cough	4,5
Diarrhoea	4
Sneezing	0,5
Jaundice and bleeding	0,4

The table shows the frequency of signs and symptoms in humans during the Rift Valley Fever epidemic that took place in Egypt in 1977.

The following complications are found in a small percentage of affected people.

## **OCULAR LESIONS**

This is the most frequent among serious complications, occurring around 7-20 days after an episode of fever, and characterised by photophobia and in some cases temporary loss of

1 of 3

## **MENINGOENCEPHALITIS**

This form has the classic signs and symptoms of meningitis: irritability, hallucinations, lethargy, convulsions, dizziness and hemiplegia. Generally, the recovery is very slow and relapses

2 of 3

## HAEMORRHAGIC FORM

This is the most serious complication of the disease as it frequently causes death. Signs and symptoms include jaundice, and widespread mucosal and cutaneous

3 of 3

In Niger, from 8 August to 21 November 2016, 266 suspected human cases of RVF were notified, with 32 deaths.

### Complete the following sentences:

Following infection camels do not normally show clinical signs excluding

Rift Valley Fever is generally benign in humans. A  syndrome can be observed in the majority of cases

In humans the ocular form is one of the most



complications; it occurs 7-20 days after an episode of fever.

abortion

flu-like

frequent

SUBMIT



# Pathological findings

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Lesions in adults are less severe than in young animals, although jaundice can be more frequent.

The **liver** is:

- moderately swollen;
- friable;
- of variable colour from yellow-brown to red-brown.

**Punctiform foci of haemorrhages and necrosis** can also be observed in the liver, giving its surface a mottled appearance.

In **lambs** petechiae and ecchymosis of the abomasal mucosa are common, with digested blood present in the lumen and in the small intestine.

In **adult** animals there is haemorrhages and oedema in the abomasal plica and there may be a large quantity of fresh blood in the intestinal lumen.



Liver - Adult sheep

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The **spleen** can show haemorrhagic foci, sometimes presenting as sub capsular marginal infarctions.

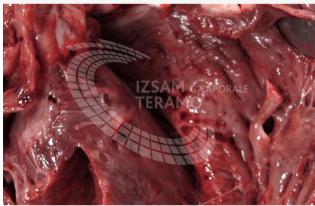
**The lymph nodes** show oedema and petechiae. The **heart** presents sub-epicardial and endocardial haemorrhages.

The lungs show alveolar and interstitial oedema and emphysema and necrosis in the alveolar wall, interlobular septum and per-bronchial lymphoid tissue.

Other findings include:

- subcutaneous serosal haemorrhages;
- serous or blood and serous fluids in the body cavities;
- pulmonary oedema;
- per-renal oedema;
- nephrosis.

**Histologically**, the most obvious lesion is **hepatic necrosis**, found in all domestic animals and in humans.



Heart - adult sheep



Spleen - adult sheep

Test your knowledge:

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In adult animals the lesions are similar to those in young animals.

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True

False

SUBMIT

There may be haemorrhagic foci and necrosis in the liver, giving its surface a mottled appearance.

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True

False

SUBMIT

The heart does not have visible lesions.

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True

False

SUBMIT





# Summary

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**Summary  
of the concepts  
presented**



**Start** 