Vesicular stomatitis virus infection Fact Sheet

1. Disease overview

Vesicular stomatitis virus (VSV) causes vesicular stomatitis, a vesicular disease affecting primarily horses, cattle and pigs. In livestock, clinical signs are indistinguishable from foot-and-mouth disease. VSV is transmitted by direct contact (including fomites) but may also be transmitted by Culicoides biting midges (Diptera; Ceratopogonidae) (WOAH, 2013a; WOAH, 2025b).

VSV infection is a WOAH-notifiable disease, but it is not listed in the EU AHL.

2. Agent

VSV is an enveloped, non-segmented, single stranded, negative-sense RNA virus that belongs to the family *Rhabdoviridae*, genus *Vesiculovirus*. The virion is bullet-shaped, approximately 70 nm in diameter and 170-200 nm in length. The genome of the virus encodes five structural proteins the nucleoprotein (N), phosphoprotein (P), the matrix protein (M), the glycoprotein (G) and the RNA-dependent RNA polymerase (L). The G glycoprotein mediates virus attachment and membrane fusion and is the principal antigen inducing virus-neutralising antibodies. (Liu et al, 2021; Kuzmin et al, 2009).

There are two distinct serogroups of VSV recognised: New Jersey (NJ) and Indiana (IND). There are four different serological complexes (subtypes) within the IND serogroup: IND-1 (classical IND) IND-2 (cocal virus) and IND-3 (alagoas virus) and IND-4 (Morreton virus) (Liu et al, 2021).

3. Geographical Distribution

The WAHIS does not collect and report information on VSV since 2014. The virus is present endemically in the Americas, with studies reporting its presence in USA, and South America. Evidence from published studies describing natural infections with this agent, as well as field epidemiological studies, are collected in the EFSA's systematic literature review (updated until 31/12/2025) and summarized in Figure 1. For more detailed information, dynamic maps, and references visit the online disease profile (accessible via the button in the top right corner).

Figure 1. Geographical distribution of epidemiological studies addressing the occurrence of VSV, as identified by the EFSA's systematic literature review (covering years 1970-2025).

4. Animal hosts

4.1. Susceptible hosts

Based on epidemiological knowledge of host–pathogen–vector interactions and outbreak reports, the main hosts of VSV are cattle, equids and pigs, whereas humans are considered as dead-end hosts. However, other susceptible species have been identified in the SLR. The SLR summary is given in Table 1.

Table 1. Susceptible host species of Vesicular stomatitis virus.

The systematic literature review reported in the VSV disease profile, identified the following susceptible species (updated until 31/12/2025, for references see online disease profile)
FIELD
Epidemiological studies carried out in the field **Pathogen was detected in the following animal species:** • No species specified **Antibodies were detected in the following animal species:** • Cervidae: No species specified • Equidae: *Equus caballus* **Outbreaks reported to WOAH included the following species:** • Bovidae: *Bos taurus, Ovis aries, Capra hircus* • Equidae: *Equus caballus* • Suidae: *No species specified*
EXPERIMENTS
Experimental studies demonstrated infection in: • Bovidae: *Bos taurus* • Equidae: *Equus caballus* • Suidae: *Sus scrofa domesticus*

4.2. Clinical Signs

Outcomes of a systematic literature review of clinical signs in 48 pig -, 15 cattle - and 8 horse study groups are displayed in Figure 2. Predominantly, dermatological clinical signs were reported in all the study groups.

Clinical sign associated with VSV resemble those of foot-and-mouth disease with the exception that VSV also affects horses. Clinical manifestation in horses, cattle and pigs is characterised by fever, vesicular formation that progress to erosions and ulcerations in the oral cavity, lips, snout (pigs) and distal limbs (coronary band). As a result, excessive salivation, lip smacking, lameness and prostration can be observed. Clinical signs can be observed for a median period of 9 to 10 days (all references from SRL are available in the online disease profile).

4.2.1. Incubation Period

The median incubation period observed in experimental studies is around 2 (1 - 3) days for horses and cattle. In pigs the median is also 2 days but incubation as long as 7 days have been reported (references from the SRL available in the online version).

4.2.2. Morbidity and case fatality

Serological studies in affected premises have reported a high fraction of seropositive cattle or horses not showing clinical signs (Mumford et al, 1998). Similar morbidities are expected for pigs. Fatality in horses and cattle is reported to be rare (Reis et al, 2009). In experimentally infected pigs, a fatality of 8.3% was observed (references from the SRL available in the online version).

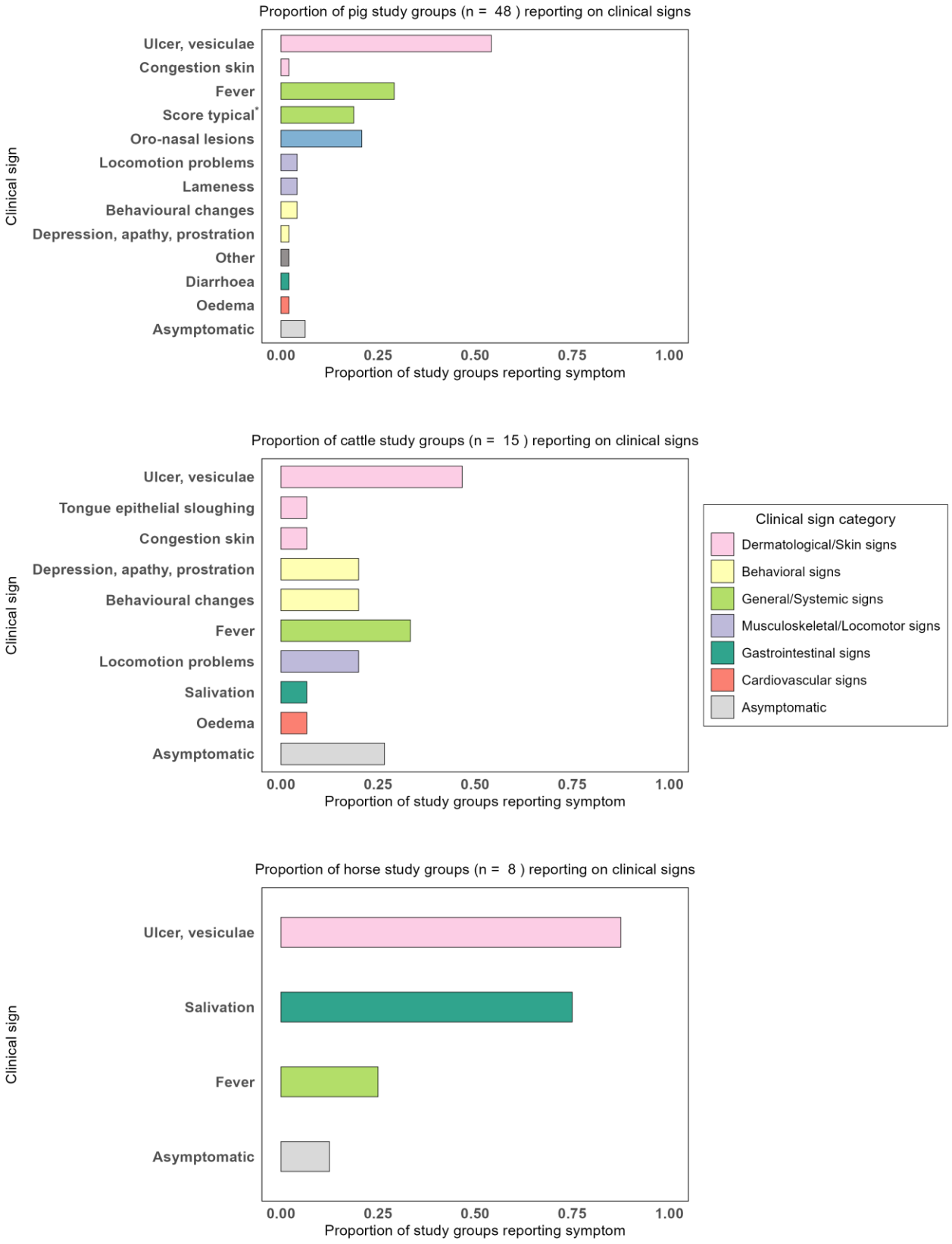
4.2.3. Zoonotic Potential

VSV is a zoonotic disease (WOAH, 2013).

5. Transmission

The mechanism of transmission of VSV is not clear, but transmission can occur both by direct contact and through insect vectors. Direct contact transmission appears to occur through contact with vesicular fluid, saliva, or contaminated fomites with the virus entering a susceptible host through abrasions of the skin or mucous membranes. Biting midges of the genus Culicoides (Diptera; Ceratopogonidae) are potential biological vectors of VSV. Mechanical transmission by vector is also possible. For more information on vector distribution, visit the Vector section in the online disease profile.

Humans may become infected through direct contact with infected animals or tissues, but human-to-human transmission has not been demonstrated (Reis et al, 2009).



*Score typical: skin lesions**.** The SLR was updated until 31/12/2025, for references see the online disease profile.

Figure 2. Clinical signs reported in the main hosts of VSV.

6. Diagnostic tests

WOAH-recommended tests (WOAH,2025b) for agent detection include virus isolation, ELISA for antigen detection, Complement fixation test (CFT) and RT-PCR. Sensitivities (Se) and specificities (Sp) higher than 90% have been reported for the RT-PCR and the antigen ELISA test. Lower Se relative to the ELISA test have been reported for CFT (SLR; Ferris et al, 2012; Alonso et al, 1991).

WOAH-recommended tests for the detection of immune response: Liquid-phase blocking ELISA, competitive ELISA, Virus neutralisation test (VNT) and Complement fixation test (CFT). The Sensitivity and Specificity for VNT and ELISA were well above 90% (SLR; Workman et al, 1986, WOAH 2025).

Table 2 presents data on the sensitivity and specificity of diagnostic tests collected through EFSA's systematic literature review; reported values correspond to the median sensitivity and specificity when multiple study groups investigated the same test and are only included when explicitly stated in the publications.

Table 1. Median sensitivity and specificity of tests to detect AHSV/AHSV antibodies reported in literature included in the systematic literature review.

Target	Test	Species	Sensitivity	N animal groups	Specificity	N animal groups	References
Antigen	C-ELISA	Cattle	94.1%	2	98.75%	2	Allende et al., 1992
Antibody	VNT	Horse	98.4 %	1	97.4%	1	Allende & Germano, 1993

7. Prevention and control

7.1. Vaccination

There are no commercial vaccines available for VSV.

7.2. Treatment

There is currently no specific antiviral treatment for VSV infection.

8. References

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