

CHAPTER 12.11.

INFECTION WITH I-AB AND I-C VARIANTS OF VENEZUELAN EQUINE ENCEPHALITIS VIRUS (VENEZUELAN EQUINE ENCEPHALOMYELITIS)

Article 12.11.1.

General provisions

Venezuelan equine encephalomyelitis (VEE) is a *vector*-borne disease of significant importance to public health transmitted by bites of culicine mosquitoes. While multiple mammalian species including humans are susceptible, while sylvatic rodents are the reservoir.

The causal agent of the VEE comprises a complex of six antigenic subtypes (I-VI), each currently considered a separate viral species. Equids are considered amplifying hosts of I-AB and I-C variants of the virus, which are the only ones associated with epidemics in equids and humans.

United States	Comment category: Change Proposed amended text: Equids are considered amplifying hosts of I-AB and I-C variants of <u>the</u> virus, which are the onlyprimary ones associated with epidemics in equids and humans. Rationale: Recommend replacing “only” with “primary.” In 1993 and 1996, the I-E enzootic subtype also caused a limited epizootic in horses in Mexico. Supporting evidence: Weaver S.C., Ferro C., Barrerea R. Boschell J. & Navarro J.C. (2004) Venezuelan equine encephalitis. <i>Annu. Rev. Entomol.</i>, 49, 141–174. Gonzalez D, Estrada-Franco JG, Carrara A, et al. (2003) Equine Amplification and Virulence of Subtype IE Venezuelan Equine Encephalitis Viruses Isolated during the 1993 and 1996 Mexican Epizootics. <i>Emerging Infectious Diseases</i>. 9(2):162-168. doi:10.3201/eid0902.020124.
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For the purposes of the *Terrestrial Code*, VEE is defined as an *infection* of equids (hereafter ‘animal host’) with I-AB or I-C variants of Venezuelan equine encephalitis virus (hereafter ‘VEEV/IABC’).

The following defines the occurrence of *infection* with VEEV/IABC:

- 1) VEEV/IABC has been isolated and identified as such in a sample from an animal host; or
- 2) nucleic acid specific to VEEV/IABC has been detected in a sample from an animal host showing clinical signs or pathological lesions consistent with VEE, or epidemiologically linked to a confirmed or suspected case, or giving cause for suspicion of previous association with or exposure to VEEV/IABC.

For the purposes of the *Terrestrial Code*, the *incubation period* shall be seven days.

For the purposes of the *Terrestrial Code*, the *infective period* shall be seven days.

Standards for diagnosis and vaccines, as well as information on the epidemiology, are described in the *Terrestrial Manual*.

Article 12.11.2.

Safe commodities

When authorising the importation or transit of the following *commodities*, *Veterinary Authorities* should not require any VEE-related conditions regardless of the *animal health status* of the country or *zone* of origin:

- 1) *meat products*;
- 2) processed hides and skins;
- 3) processed hooves;
- 4) gelatine and collagen;
- 5) *protein meal*;
- 6) extruded dry pet food₁;
- 7) rendered fat.

Article 12.11.3.

Country or zone free from VEE

A country or *zone* may be considered free from VEE when:

- 1) the *infection* has been notifiable in the entire country for at least the past 24 months;
- 2) either:
 - a) the historical freedom provisions as described in point 2 b) of Article 1.4.6. are met; or
 - b) *surveillance* in accordance with Article 12.11.10. has demonstrated no evidence of the absence of infection with VEEV/IABC in the country or *zone* for at least the past 24 months;
- 3) appropriate *biosecurity* and *sanitary measures* to prevent the introduction of *infection* have been in place; in particular, the importations or movements of animal hosts and their *commodities* into the country or *zone* have been carried out in accordance with this chapter or other relevant chapters of the *Terrestrial Code*, including Chapter 2.1. 'Import risk analysis'.

Article 12.11.4.

Compartment free from VEE

The establishment of a *compartment* free from VEE should follow the relevant provisions laid down in Article 12.11.3. and in Chapters 4.4. and 4.5.

Animal hosts in the free *compartment* should be protected against culicine mosquitoes by the application of an effective *biosecurity* management system, other preventive measures, and measures in accordance with Article 12.11.9.

Article 12.11.5.

Country or zone infected with VEE

A country or *zone* should be considered as infected with VEE when the conditions for freedom from VEE are not met.

Article 12.11.6.

Recovery of free status

Should a *case* of VEE occur in a previously free country or *zone*, its status may be recovered in accordance with Article 12.11.3.

Article 12.11.7.

Recommendations for importation of equids from countries, zones or compartments free from VEE

Veterinary Authorities of importing countries should require the presentation of an *international veterinary certificate* attesting that the animals:

- 1) showed no clinical signs of VEE on the day of shipment;
- 2) were kept in a country, *zone* or *compartment* free from VEE since birth or for at least the past ~~1490~~ 1490 days prior to shipment.

Article 12.11.8.

Recommendations for importation of equids from countries or zones infected with VEE

Veterinary Authorities of importing countries should require the presentation of an *international veterinary certificate* attesting that the animals:

- 1) showed no clinical signs consistent with VEE on the day of shipment; and
- 2) either,
 - a) were vaccinated against VEEV in accordance with the manufacturer's instructions at least ~~30~~60 days prior to shipment; or
 - b) were isolated in a *vector*-protected *quarantine centre* for at least seven days prior to shipment, which is located in an area of demonstrated low *vector* activity, were subjected to a nucleic acid test at least between two to five days after entry into the *quarantine centre* with negative results, and were protected from culicine mosquito bites at all times during transportation from the *quarantine centre* to the *place of shipment* in accordance with Article 12.11.9.

United States	Comment category: Addition Proposed amended text: b) were isolated in a <i>vector</i>-protected <i>quarantine centre</i> for at least seven days prior to shipment, which is located in an area of demonstrated low <i>vector</i> activity, were subjected to an antibody or nucleic acid test <u>at least between two to five</u> days after entry into the <i>quarantine centre</i> with negative results, Rationale: Recommend adding antibody testing for importing equids from affected VEE countries or zones to align for consistency with the Terrestrial Manual. The recent revision and adoption of Chapter 3.6.4. of the Terrestrial Manual includes IgM capture ELISA as a means for pre-movement testing and confirming a VEE clinical case. Allowing both molecular and antibody detection methods is less restrictive for countries in their ability to detect VEEV with antemortem diagnostics for international movement of equids. Supporting evidence: n/a
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Article 12.11.9.

Protecting equids from culicine mosquito bites

- 1) Vector-protected quarantine centre

The means of protection of the *quarantine centre* should at least comprise the following:

- a) appropriate physical barriers at entry and exit points, for example a double-door entry-exit system;
- b) openings of the building are *vector* screened with mesh of appropriate gauge;
- c) *vector surveillance* and *vector* control within and around the building;
- d) measures to limit or eliminate larval habitats for *vectors* in the vicinity of the *quarantine centre*, such as as removal of standing water;
- e) Standard Operating Procedures for operation of the *quarantine centre* and for transport of equids to the *place of loading*.

2) During transportation

When transporting unvaccinated equids through countries or *zones* infected with VEEV/IABC, *Veterinary Authorities* should require that strategies to protect equids from culicine mosquito bites are in place, considering the local ecology of the *vector*.

a) Transport by land

Risk management strategies should include:

- i) treating animals with an *approved* repellent to prevent bites prior to and during transportation, in *means of transport* disinfected and disinfested with *approved* disinfectant and insecticide;
- ii) *loading*, transporting and *unloading* animals at times of low *vector* activity, and avoiding areas of known high *vector* activity;
- iii) ensuring *means of transport* do not stop en route during dawn or dusk, or overnight, unless the *means of transport* is *vector* protected (e.g. fitted with mosquito-proof nets);
- iv) using historical, current or modelling information on VEEV/IABC and *surveillance* for *vectors* at common stopping and offloading points to identify low risk ports and transport routes.

b) Transport by air

Prior to *loading* the equids, *containers* are sprayed with an *approved* insecticide.

Containers in which equids are being transported, and the cargo hold of the aircraft should be sprayed with an *approved* insecticide when the doors have been closed and prior to take off. All possible insect harbourage should be treated. The insecticide sprayers should be retained for inspection on arrival.

In addition, during any stopover in countries or *zones* where *infection* with VEEV/IABC occurs, prior to the opening of any aircraft door and until all doors are closed, netting of appropriate gauge impregnated with an *approved* insecticide should be placed over all *containers*.

Article 12.11.10.

Surveillance for VEE

Surveillance of VEE should be carried out in accordance with Chapter 1.4. and with the following recommendations.

- 1) The primary objective of *surveillance* for VEE, including both epizootic and enzootic variants, is to mitigate animal health and public health *risks* through early detection and rapid response. *Surveillance* enables *Veterinary Authority* to coordinate effectively and in a timely manner with public health and other relevant *Competent Authorities*, under a One Health approach to facilitate facilitating the exchange of information critical to protect both animal health and human health. It also supports the safe *international trade* of equids.
- 2) Equids are amplifying hosts of VEEV/IABC and key sentinel species for the presence of the VEEV epizootic variants. In some cases, they may also act as useful sentinels for enzootic variants providing valuable early warning of virus circulation in endemic regions. As such, they should be targeted by *surveillance*.
- 3) *Early warning systems* for VEE should be capable of identifying epidemic events. *Veterinary Authorities* should promote awareness campaigns to sensitise the owners and keepers of equids, *veterinarians* and the public health authorities of the disease risks.

Clinical and syndromic *surveillance* to detect signs of *infection* with VEEV/IABC in animal hosts are essential components of an *early warning system*. Clinical disease in animal hosts is characterised by fever, anorexia, and severe depression. In severe cases, it can progress to neurological signs and death. Clinical *surveillance* targeted at neurological signs in equids can provide reinforced evidence of the occurrence of an epidemic. However, clinical signs are not pathognomonic per se. Suspect cases should always be confirmed by laboratory testing, that should include sequencing and taking into account the epidemiological situation. ~~Because VEEV mutates rapidly~~ Given that other VEEV subtypes (e.g. I-E, I-D,

II) have on occasion been associated with disease in equids or humans, and small genetic changes may give rise to new epizootic variants, it is important to monitor molecular and epidemiological data for changes in transmission and genetic diversity, especially in endemic lineages, to detect newly emerging epizootic strains.

United States	Comment category: Addition Proposed amended text: ...it is important to monitor molecular and epidemiological data for changes in transmission and genetic diversity, especially in endemic lineages, to detect newly emerging epizootic strains and report any important health information in accordance with Article 1.1.5. Rationale: Recommend adding “and report any important health information in accordance with Article 1.1.5.” at the end of the final sentence in Paragraph 2 under Article 12.11.10, point 3. If obligatory notification is limited to VEE I-AB and I-C variants, this language serves as an important reminder that reporting other VEE variants (e.g., I–E, I–D, II) causing clinical disease in animal hosts is still possible through WOAHS mechanisms and valuable to Member Countries for disease preparedness and response efforts, protecting both animal and human health. Supporting evidence: n/a
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- 4) Considering the epidemiological situation in association with prevailing agricultural practices (i.e., rice culture) and weather conditions favouring the emergence of a large population of mosquitoes, an epidemic of VEEV/IABC should be suspected when there is an increased number of equids showing clinical signs consistent with *infection* with VEEV/IABC or reports of infection in humans. This is especially the case for countries or *zones* where *infection* with VEEV/IABC has occurred, or countries or *zones* adjacent to a country or *zone* in which epidemics have been reported. Ecological conditions can be assessed through sharing and analysis of meteorological data, including information access through remote sensing to estimate precipitation and water levels, and especially monitoring of *vector* activity.
- 5) In epidemic situations, *surveillance* should be conducted to define the extent of the epidemic area for the purpose of disease prevention and control.
- 6) *Surveillance* for *vectors* conducted in accordance with Chapter 1.5. may be helpful in identifying *vector* activity and a situation ~~conducting~~ conducive to risk of transmission for VEEV/IABC. However, testing large numbers of mosquitoes to detect VEEV/IABC circulation is of low sensitivity and, therefore, is not recommended as a routine procedure. Rather, *animal*-based *surveillance* strategies are preferred to detect VEEV/IABC circulation.