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# *Equine herpesvirus-1 infection*

*risk assessment by EFSA*

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Trusted science for safe food



- Outbreak of equine herpesvirus-1 (EHV-1) in the context of a major equestrian competition in early 2021
- EHV-1 is not included in the list of diseases in AHL, EC to consider
  - Assessment along criteria art. 7 AHL
  - Listing – art. 5 criteria
  - Categorisation – art. 9 criteria

- provisions for safe trade in equine animals and germinal products from countries affected by EHV-1;
- identifying possible routes and risks of spreading EHV-1 between animals in EU and those imported from third countries;
- different susceptibility of various species to EHV-1 and of different virulence of various EHV-1 viruses
- measures to monitor occurrence of EHV-1 in equine animals and mitigate mortality

- Assess following criteria in Article 7 of the AHL, its eligibility of being listed for Union intervention as laid down in Article 5 of the AHL;
- if found eligible to be listed for Union intervention, provide:
  - an assessment of its compliance with each of the criteria in Annex IV to the AHL for the purpose of categorisation of diseases in accordance with Article 9 of the AHL;
  - a list of animal species that should be considered candidates for listing in accordance with Article 8 of the AHL

■ Where the outcome of the assessment in point I suggests listing of the disease in accordance with Article 5(3) of Regulation (EU) 2016/429:

(a) assess the potential of EHV-1, notably its neurotropic variant, to affect equine animals in the Union;

(b) assess the performance of the available diagnostic methods for the detection of EHV-1, including its neurotropic single point mutations;

(c) describe and assess possible methods and feasible risk mitigation measures to ensure safe international and EU trade in equine animals and their germinal products, including movement restrictions.

- Equine herpesvirus (EHV) DNA virus, genus Varicellovirus, affecting wild and domestic equids, bears
- one of the most important and prevalent disease (>60% latent infection) of horses worldwide (Equine Rhinopneumonitis) , considered endemic in the EU
- produce a latent lifelong infection in horses > can reactivate leading to clinical disease
- EHV-1 infection : from subclinical infection to a severe disease
  - respiratory system, occasionally abortion and neurological disease, Equine Herpesvirus Myeloencephalopathy with possible fatal outcome.
  - Outbreaks are often reactivation of a past infection
- multifactorial and its severity depend on age, housing, immune and health status.
- large uncertainty about the causality of neurological form
- listed by the OIE, but no compulsory notification in all MSs (e.g. Italy, Spain, Sweden)
- often under-reported despite the wide presence among horses in Europe

# Large outbreak in Valencia, 2021

- In 2021, most severe EHV-1 epidemic outbreak in the last decades in Valencia (Spain)
- rapidly spread to over 30 premises in different MSs, >> cancellation of sport horse events in 12 European countries, at least, 18 dead horses reported
- wide geographic spread possibly due to delayed diagnosis and late application of biosecurity measures
- this event led to increasing awareness about EHV-1 in EU
- virus that caused outbreak in Valencia in 2021 genetically close to other viruses circulating before in Europe, and did not present the so-called neuropathogenic genotype.
- no specific neuropathogenic EHV-1 virus strains, and that any strain can lead to respiratory, reproductive and neurological signs

- in presence of respiratory signs >> PCR performed on nasopharyngeal swabs: most sensitive method to detect shedding horses.
- Other sample matrix in case of abortions or neurological signs
- Genotyping should be used as an adjunct to epidemiological investigations
- Serology (CF) for field surveillance, paired samples for recent infection
- no diagnostic method available to detect latent infections



- mostly whole inactivated vaccines
- protection requires an effective antibody and cellular immune response
- Protection from EHV-1 infection is not complete
- Protection from abortion is documented
  - frequency of abortion storms due to EHV-1 infection has decreased since the introduction of EHV vaccination in the late 1980s
- none of the vaccines protects against neurological disease

- Health certificate before movement to a new premise - no clinical signs and vaccination status
- Pre-movement testing depending on the epidemiological situation.
- Promoting vaccination against EHV-1 (mares) and information on its limitations
- Reduced stress: transport, weaning, poor health (e.g. parasitism)
- Isolation of horses on arrival in a new premise, health monitoring (rectal body temperature)
- Early detection of EHV-1 infection by well-established and validated diagnostic tools and laboratories
- At competitions: movement restriction until resolution

# Art 5 - listing

Criteria to be met by the disease:		Outcome			
		Median range (%)	Criterion fulfilment	Number of "not applicable (n.a.)"	Number of experts
According to AHL, a disease shall be included in the list referred to in point (b) of paragraph 1 of Article 5 if it has been assessed in accordance with Article 7 and meets all of the following criteria					
A(i)	the disease is transmissible	99-100	Fulfilled	0	20
A(ii)	animal species are either susceptible to the disease or vectors and reservoirs thereof exist in the Union	99-100	Fulfilled	0	20
A(iii)	the disease causes negative effects on animal health or poses a risk to public health due to its zoonotic character	95-100	Fulfilled	0	20
A(iv)	diagnostic tools are available for the disease	99-100	Fulfilled	0	20
A(v)	risk-mitigating measures and, where relevant, surveillance of the disease are effective and proportionate to the risks posed by the disease in the Union	33-90	Uncertain	0	20

In addition to the criteria set out above at point A(i)-A(v), the disease needs to fulfil at least one of the following criteria					
B(i)	the disease causes or could cause significant negative effects in the Union on animal health, or poses or could pose a significant risk to public health due to its zoonotic character	66-95	Fulfilled	0	20
B(ii)	the disease agent has developed resistance to treatments and poses a significant danger to public and/or animal health in the Union	10-33	Not fulfilled	17	20
B(iii)	the disease causes or could cause a significant negative economic impact affecting agriculture or aquaculture production in the Union	10-33	Not fulfilled	0	20
B(iv)	the disease has the potential to generate a crisis or the disease agent could be used for the purpose of bioterrorism	0-10	Not fulfilled	0	20
B(v)	the disease has or could have a significant negative impact on the environment, including biodiversity, of the Union	5-30	Not fulfilled	0	20

## Criterion A(v) – arguments for uncertainty

- The clinical forms caused in general not too severe the risk-mitigating measures may be proportionate to the risks posed by the disease.
- diagnostic testing is inaccurate in detecting latent infection
- factors for re-activation of the infection are not known
- The measures appear to be at least relatively effective in reducing morbidity and fatality in naive animals.
- no official control programmes and the level of surveillance of EHV outbreaks is highly variable between MSs.
- the absence of notification requirements may lead to underreporting and skipping the application of containment measures (e.g. movement restrictions).
- The control is therefore often at farm-level, where biosecurity measures seem to be effective.
- Vaccination is not compulsory , effectiveness against the different forms of disease is variable.
- It is questionable whether the disease would fade out by itself without risk-mitigating measures in place.

# AHL categorisation

Category	Article 9 criteria										
	1° set of criteria					2° set of criteria					
	1	2.1	2.2	2.3	2.4	3	4	5a	5b	5c	5d
	Geographical distribution	Transmissibility	Routes of transmission	Multiple species	Morbidity and mortality	Zoonotic potential	Impact on economy	Impact on society	Impact on animal welfare	Impact on environment	Impact on biodiversity
A	0-1	33-66	10-33	95-99	5-10	0-1	33-66	10-33	10-66	5-10	10-66
B	1-5	66-95	10-33	95-99	66-90	0-1	33-66	10-33	10-66	5-10	10-66
C	95-99	66-95	99-100	95-99	33-66	0-1	10-66	10-33	10-66	5-10	10-66
D	66-90										
E	33-90										

# Two outputs

## Clinical impact, diagnosis and control of Equine Herpesvirus-1 infection in Europe





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### Assessment of listing and categorisation of animal diseases within the framework of the Animal Health Law (Regulation (EU) No 2016/429): infection with Equine Herpesvirus-1

EFSA Panel on Animal Health and Welfare (AHAW) ✉ Søren Saxmose Nielsen, Julio Álvarez, Dominique Joseph Bicout, Paolo Calistri, Elisabetta Canali, Julian Ashley Drewe ... [See all authors](#) ▾

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Thank you for you attention!

Further slides, in case needed.....



# Category A

Criteria to be met by the disease: The disease needs to fulfil <b>all</b> of the following criteria		Outcome			
		Median range (%)	Criterion fulfilment	Number of NA	Number of experts
1	the disease is not present in the territory of the Union OR present only in exceptional cases (irregular introductions) OR present in only in a very limited part of the territory of the Union	0-1	Not fulfilled	0	20
2.1	the disease is highly transmissible	33-66	Uncertain	0	20
2.2	there are possibilities of airborne or waterborne or vectorborne spread	10-33	Not fulfilled	0	18
2.3	the disease affects multiple species of kept and wild animals OR single species of kept animals of economic importance	95-99	Fulfilled	0	17
2.4	the disease may result in high morbidity and significant mortality rates	5-10	Not fulfilled	0	17
<b>At least one criterion to be met by the disease:</b>					
In addition to the criteria set out above at point 1-2.4, the disease needs to fulfil at least one of the following criteria					
3	the disease has a zoonotic potential with significant consequences on public health, including epidemic or pandemic potential OR possible significant threats to food safety	0-1	Not fulfilled	0	20
4	the disease has a significant impact on the economy of the Union, causing substantial costs, mainly related to its direct impact on the health and productivity of animals	33-66	Uncertain	0	18
5(a)	the disease has a significant impact on society, with in particular an impact on labour markets	10-33	Not fulfilled	0	19
5(b)	the disease has a significant impact on animal welfare, by causing suffering of large numbers of animals	10-66	Uncertain	0	19
5(c)	the disease has a significant impact on the environment, due to the direct impact of the disease OR due to the measures taken to control it	5-10	Not fulfilled	0	19
5(d)	the disease has a significant impact on a long-term effect on biodiversity or the protection of endangered species or breeds, including the possible disappearance or long-term damage to those species or breeds	10-66	Uncertain	0	19

# Category B

Criteria to be met by the disease: The disease needs to fulfil all of the following criteria		Outcome			
		Median range (%)	Criterion fulfilment	Number of NA	Number of experts
1	the disease is present in the whole OR part of the Union territory with an endemic character AND (at the same time) several Member States or zones of the Union are free of the disease	1-5	Not fulfilled	0	20
2.1	the disease is moderately to highly transmissible	66-95	Fulfilled	0	19
2.2	there are possibilities of airborne or waterborne or vectorborne spread	10-33	Not fulfilled	0	18
2.3	the disease affects single or multiple species	95-99	Fulfilled	0	17
2.4	the disease may result in high morbidity with in general low mortality	66-90	Fulfilled	0	17
<b>At least one criterion to be met by the disease:</b> In addition to the criteria set out above at point 1-2.4, the disease needs to fulfil at least one of the following criteria					
3	the disease has a zoonotic potential with significant consequences on public health, including epidemic potential OR possible significant threats to food safety	0-1	Not fulfilled	0	20
4	the disease has a significant impact on the economy of the Union, causing substantial costs, mainly related to its direct impact on the health and productivity of animals	33-66	Uncertain	0	18
5(a)	the disease has a significant impact on society, with in particular an impact on labour markets	10-33	Not fulfilled	0	19
5(b)	the disease has a significant impact on animal welfare, by causing suffering of large numbers of animals	10-66	Uncertain	0	19
5(c)	the disease has a significant impact on the environment, due to the direct impact of the disease OR due to the measures taken to control it	5-10	Not fulfilled	0	19
5(d)	the disease has a significant impact on a long-term effect on biodiversity or the protection of endangered species or breeds, including the possible disappearance or long-term damage to those species or breeds	10-66	Uncertain	0	19

# Category C

Criteria to be met by the disease:		Outcome			
The disease needs to fulfil all of the following criteria		Median range (%)	Criterion fulfilment	Number of NA	Number of experts
1	the disease is present in the whole OR part of the Union territory with an endemic character	95-99	Fulfilled	0	20
2.1	the disease is moderately to highly transmissible	66-95	Fulfilled	0	19
2.2	The disease is transmitted mainly by direct or indirect transmission	99-100	Fulfilled	0	20
2.3	the disease affects single or multiple species	95-99	Fulfilled	0	17
2.4	the disease usually does not result in high morbidity and has negligible or no mortality AND often the most observed effect of the disease is production loss	33-66	Uncertain	0	17
<b>At least one criterion to be met by the disease:</b>					
In addition to the criteria set out above at point 1-2.4, the disease needs to fulfil at least one of the following criteria					
3	the disease has a zoonotic potential with significant consequences on public health, or possible significant threats to food safety	0-1	Not fulfilled	0	20
4	the disease has a significant impact on the economy of parts of the Union, mainly related to its direct impact on certain types of animal production systems	10-66	Uncertain	0	19
5(a)	the disease has a significant impact on society, with in particular an impact on labour markets	10-33	Not fulfilled	0	19
5(b)	the disease has a significant impact on animal welfare, by causing suffering of large numbers of animals	10-66	Uncertain	0	19
5(c)	the disease has a significant impact on the environment, due to the direct impact of the disease OR due to the measures taken to control it	5-10	Not fulfilled	0	19
5(d)	the disease has a significant impact on a long-term effect on biodiversity or the protection of endangered species or breeds, including the possible disappearance or long-term damage to those species or breeds	10-66	Uncertain	0	19

Diseases in category D <b>need to fulfil criteria of section 1, 2, 3 or 5 of Annex IV of AHL</b> and the following:		Outcome			
		Median range (%)	Criterion fulfilment	Number of NA	Number of experts
D	the risk posed by the disease in question can be effectively and proportionately mitigated by measures concerning movements of animals and products in order to prevent or limit its occurrence and spread	66-90	Fulfilled	0	19

Diseases in category E <b>need to fulfil criteria of section 1, 2 or 3 of Annex IV of AHL</b> and/or the following:		Outcome	
		Median range (%)	Fulfilment
E	surveillance of the disease is necessary for reasons relating to animal health, animal welfare, human health, the economy, society or the environment (If a disease fulfils the criteria as in Article 5, thus being eligible for being listed, consequently category E would apply.)	33-90	Uncertain