Epizootic Haemorrhagic Disease: European Food Safety Authority Assessment on the Risks of Introduction and Spread in Europe

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Following a request from the European Commission, the European Food Safety Authority (EFSA) Panel on Animal Health and Welfare was asked to deliver a scientific opinion on the epizootic haemorrhagic disease (EHD). The mandate was composed of four terms of reference: i) the significance of the presence, origin and occurrence of EHD virus (EHDV) in susceptible species (specially livestock animals) in the European Union (EU) neighbouring countries; ii) the possibility of EHD spreading to and within the EU and persisting; iii) the role played by different vectors and the means to control them; and iv) the possible measures to control and eradicate the disease including surveillance, control of vectors, availability of suitable vaccines, and other elements.

Under EFSA coordination, a working group of experts was invited to review the scientific knowledge available on EHD: its aetiology, the pathogenicity of the disease and epidemiology in different areas of the world. The review reported similarities of the disease with bluetongue, in particular concerning transmission. EHDV is transmitted by *Culicoides* vectors and it is possible that competent vectors for both diseases overlap. However, considerable knowledge gaps exist regarding factors that may influence vectorial capacity. Seven serotypes of EHDV are currently identified, from these only three (EHDV-2, 6 and 7) have been reported to cause clinical disease in cattle. Sheep may be infected but without clinical signs. EHD has been recognised as a serious disease in White-Tailed deer in North America. The Ibaraki strain (EHDV-2) caused serious outbreaks in Japan, and outbreaks of clinical disease have been reported from North Africa and West Asia in recent years. The similarity between recent EHD outbreaks in North Africa and West Asia, and bluetongue outbreaks at the end of the 1990s and the beginning of the 2000s constitutes a reason of concern.

EFSA developed a risk assessment on the risk of introduction in the EU by taking in consideration three possible entrance pathways: i) via imported infectious animals; ii) via infectious vectors; and iii) other routes such as vaccines or germplasm. The risk of introduction by imported animals (wild or domestic, legal or illegal) was estimated by a simulation model based on the assumptions that the animal is: i) originated from an infected area; ii) infected prior to the movement; iii) in incubation or viraemic at the time of movement; and iv) in incubation or viraemic when introduced, which will depend not only on the probability of infection but also on the duration of the quarantine prior to entrance and the sensitivity of the test used. The risk assessment for the introduction by infectious vectors was a qualitative assessment. The consequence assessment, i.e. the risk of transmission to other animals/vectors after introduction/exposure, was considered to depend on: i) the vector abundance in the considered area; ii) the viraemia duration; iii) the number of midges per animal (vector density); iv) the number of bites per animal and per day; and v) the probability that infection is transmitted from an infectious animal to a susceptible vector per bite. The risk was estimated by using a temperature dependent model for the basic reproduction number. Risk estimates were provided for the different pathways. The risk assessment models also helped appraise the value of possible control measures.

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