

Risk assessment of the introduction of African Horse Sickness (AHS) into the Republic of Ireland (ROI)

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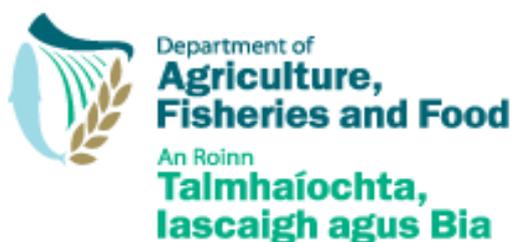
Inma Aznar

Centre for Veterinary Epidemiology and Risk Analysis
UCD Agriculture, Food Science & Veterinary Medicine
University College Dublin
Belfield, Dublin 4

Billy McAteer, Sally Gaynor

Department of Agriculture, Fisheries and Food (DAFF)

*with contributions from
Des Leadon, Irish Equine Centre*



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1. Background

African Horse Sickness (AHS) is a highly infectious non contagious viral disease that affects equidae (horses, ponies, donkeys, mules, zebras and other hybrids). The disease does not affect humans. The mortality rate varies depending on the form of the disease and the species but it can be as high as 95%. AHS is endemic in sub-Saharan central and east Africa. The disease occasionally spreads from central to southern or northern Africa. Several outbreaks have been reported outside Africa in the 20th century - including the Middle East, Spain, Portugal, Saudi Arabia, Yemen and the Cape Verde Islands (World Organisation for Animal Health, OIE, 2011).

AHS is caused by the African Horse Sickness Virus (AHSV) which belongs to the genus Orbivirus. Orbiviruses are transmitted to animals mainly by arthropod vectors. The distribution of these viruses is very similar to the distribution of their specific vector and it is therefore influenced by climatic conditions. AHSV is transmitted by midges of the genus *Culicoides* which are also the vectors involved in Bluetongue (BT) transmission. The recent change of the distribution of BT virus (which up to 1998 had only occurred in Europe sporadically) with the emergence of multiple serotypes in Europe and parts of North America, has generated concerns regarding the potential emergence of other diseases such as AHS in countries/areas that have been traditionally free. It is believed that the recent spread of diseases such as BT is multifactorial; anthropogenic, social factors and the movement of infected hosts/vectors as well as the possible influence of climate change have been highlighted as potential factors (MacLachlan and Guthrie, 2010).

AHS is of high importance not only because of the animals' welfare but also because of the serious implications on international trading that would be imposed if the disease was to be diagnosed in the Republic of Ireland (ROI). Restrictions on live equidae and their products would have a great economic impact. MacLachlan and Guthrie (2010) considered that out of the genus Orbivirus AHSV and BT virus (BTV) are the most economically important viruses. A survey of *Culicoides* species in Ireland was carried out between April 2007 and April 2010 by the National University of Ireland Galway in conjunction with the Department of Agriculture, Fisheries and Food (McCarthy et al., 2010). This survey found potential vectors for AHSV (*C. obsoletus* and *C. pulicaris*) to be present in each year of the survey.

The aim of this document is to qualitatively assess the likelihood of the introduction of AHS into ROI. Although in rigorous terms a Risk Assessment should include three stages: Release Assessment, Exposure Assessment and Consequence Assessment, this document will only cover the two first stages. The Consequence Assessment, although not less important, is not within the scope of this work. This is an ongoing document and it will be updated to take account of potential changes in the distribution of the virus, vector, EU regulations and new scientific knowledge.

2. Risk Assessment

2.1 Risk Question

“What is the likelihood of the introduction of any serotype of African Horse Sickness to the Republic of Ireland?”

2.2 Hazard identification

The hazard of interest is any of the 9 serotypes (1-9) of the African Horse Sickness virus (AHSV).

2.3 Risk Pathways

Three main pathways by which AHSV could be introduced into ROI have been identified: 1) legal importation of infected equidae, 2) introduction of infected vectors and 3) legal importation of authorised biologicals and/or germplasm. These three pathways are shown in Figure 1.

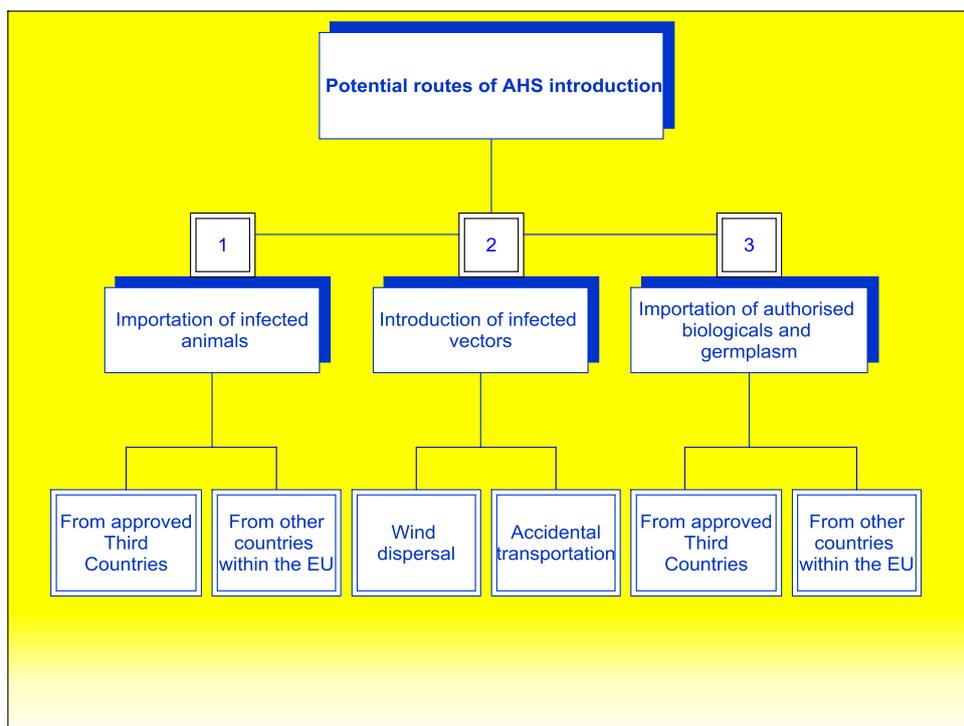


Figure 1. Routes of AHSV introduction

This assessment has not considered the introduction of AHSV via illegal importation of infected equidae and/or their products. Although this possibility can not be excluded, it is very difficult to quantify.

2.4 Definition of Risk

For qualitatively assessing the risk posed in each pathway in a standardised way a definition of the different categories of risk has to be drawn. A description of the risk categories used in this assessment is shown below (EFSA, 2006):

Category	Definition
Negligible	Event is so rare that it does not merit to be considered
Very low	Event is very rare but cannot be excluded
Low	Event is rare but does occur
Medium	Event occurs regularly
High	Event occurs very often
Very high	Event occurs almost certainly

Figure 2. Description of the risk categories used in the assessment

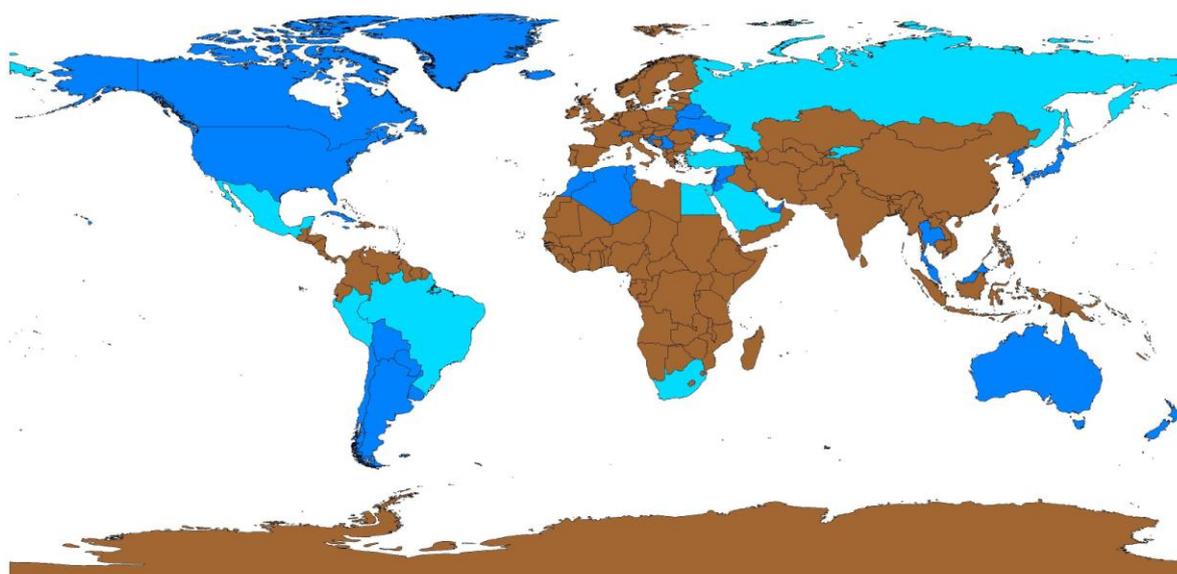
2.5 Evaluation of the risk involved in each pathway

2.5.1 Legal importation of infected equidae

- a) Importation of live equidae from approved Third Countries

-EU regulations

Importation of live equidae from Third Countries is permitted in the EU only when the country or area of origin has been approved by Member States as stated in Commission Decision 2004/211/EC. The list of approved Third Countries and parts of territory from which imports of live equidae are authorized varies depending on the category and their final import purpose: temporary admission, re-entry, imports of registered horses, slaughter, and breeding and production. In some cases, only specified categories of equidae or particular types of importation are authorised from a part of the territory of a Third Country. For example the map below shows countries from which importation of registered horses is authorised and those from which importation is only allowed from certain areas of the country in dark and light blue colour respectively.



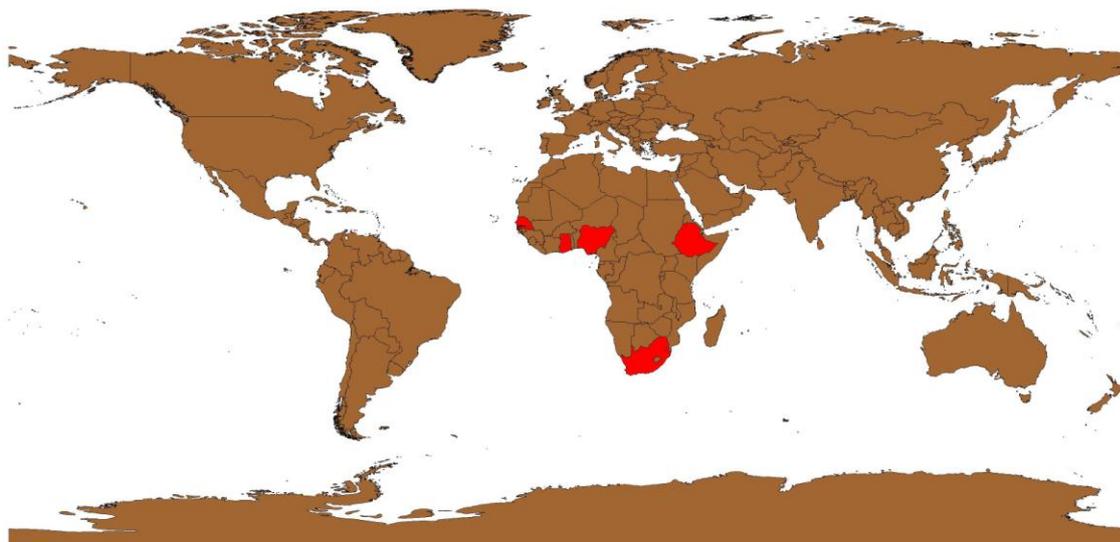
■ Importation allowed from anywhere in the country
■ Importation allowed from certain parts of the country

Figure 3. Map of the world showing countries from which importation of registered horses into the EU is authorised from the totality (dark blue) or from certain parts of the country (light blue)

These approved countries or areas are also categorised into different sanitary groups and the importation rules also vary according to these categories. There are 6 different sanitary groups going from A to F including in group A, countries with the lowest potential for animal health risk (Greenland, Iceland and Switzerland) and in group F, countries posing the highest animal health risk (South Africa). Given the different health situations in these groups, specific animal health certificates for each category and sanitary group were established (Commission Decisions 92/260/EEC, 93/195/EEC, 93/196/EEC and 93/197/EEC). These health certificates have to be completed by an official veterinarian prior to the animal/animals leaving the country of origin.

-AHS outbreak reports

Countries reporting outbreaks of AHS from 1995 to 2010 (based on the World Animal Health Information Database immediate notifications on outbreaks and follow up data from OIE) are shown in red in the map below. Swaziland, South Africa, Nigeria, Senegal, Ethiopia and Ghana reported at least one outbreak of AHS during this period (further outbreaks in Gambia 2007 and 2009, and in Kenya 2007 are included on the Institute of Animal Health (IAH) website, but were not reported to OIE).



■ African Horse Sickness reported since 1995

Figure 4. Map of the world showing countries that reported at least one case of AHS from 1995 to 2010 based on the WAHID information system of the OIE

-Irish data on importation of equidae from Third Countries

Data from the EU Trade Control and Expert System (TRACES) indicate that a total of 438 horses were imported into Ireland from Third Countries in 2009 and 405 in 2010 (see breakdown of countries of origin in Table 1 below). Out of this figure, 73 % were imported directly into the country in 2009, and 74% in 2010. The remainder were imported through Border Inspection Posts in other Member States (mainly the UK, but also Belgium, Germany, Finland, France, Luxembourg, Netherlands and Poland).

The majority of the horses originated in the United States - 71% in 2009 and 78% in 2010. In 2009, the other main countries of origin were Australia (10.3%), United Arab Emirates (8.2%), Canada (3%) and New Zealand (2.7%). In 2010, the other main countries of origin were United Arab Emirates (7.9%), Australia (4.4%), Canada (3.7%), Russian Federation (2%) and New Zealand (1%). The rest of the countries from which a very small number of horses (less than 1%) were imported were: Argentina, Chile, Egypt, Hong Kong, Libya, Saudi Arabia, South Africa, Turkey and Uruguay. Only 2 horses were imported from South Africa in each year.

Table 1. Number and percentage of horses imported into Ireland in 2009 and 2010 directly from Third Country or via Border Inspection Post in another Member state. Data obtained from the EU Trade Control and Expert System (TRACES)

Country of origin	Horses imported in 2009		Horses imported in 2010	
	Number	%	Number	%
Argentina (AR)	4	0.9	3	0.7
Australia (AU)	45	10.3	18	4.4
Canada (CA)	13	3	15	3.7
Chile (CL)	2	0.5	0	0
Egypt	0	0	3	0.7
Hong Kong	0	0	2	0.5
Libya (LY)	2	0.5	0	0
New Zealand (NZ)	12	2.7	4	1
Russian Federation	0	0	8	2
Saudi Arabia (SA)	2	0.5	0	0
South Africa (ZA)	2	0.5	2	0.5
Turkey (TY)	5	1.1	2	0.5
UAE (AE)	36	8.2	32	7.9
Uruguay (UY)	4	0.9	0	0
USA (US)	311	71	316	78
TOTAL	438	100	405	100

-Risk Assessment

South Africa is the only country reporting outbreaks of AHS since 1995 from which importation of certain categories of horses is authorised. Registered horses are authorised to be imported from the Metropolitan area of Cape Town, although importation is not allowed from anywhere else in South Africa. Importation of other types of equidae is not allowed from anywhere in South Africa. The detailed conditions for movement controls into and within the AHS-free region, and for the export of registered horses to the EU are laid down in Commission Decision 2008/698/EC.

The following considerations were taken when evaluating the risk of importation of registered horses from South Africa:

- Horses are required to undergo pre-export isolation during the last 40 days immediately preceding the exportation in an approved quarantine station. The veterinary authorities of South Africa are required to carry out the inspections at the quarantine stations and must notify the Commission and the Member States in the case of approval of additional quarantine stations (inspectors from DG SANCO's Food and Veterinary Office inspected one of two quarantine stations in 2005).

- The quarantine station has to conform to conditions for vector-protection.

- Horses are required to have been resident on a holding in the AHS-free region under veterinary supervision during the 60 days immediately preceding the exportation.

- As the incubation period is usually between 7 and 14 days and the symptoms associated with AHS in horses are severe, it is unlikely that they would be missed at the pre-exportation examination carried out by an official veterinarian as required by EU regulations.

- EU regulations require horses imported from South Africa to be tested for AHS as described in Annex 4 to Council Directive 2009/156/EC. Non vaccinated horses have to have a negative blood test

for AHS within 10 days of export; if the horses have been vaccinated for AHS, then two blood tests have to be carried out with an interval of between 21 and 30 days. These tests have to show a lack of increase in antibody level. Details of vaccination must be recorded on the certificate and on the passport accompanying the horse.

- During transport from the quarantine to the airport, the horses must be protected from vectors, and the aircraft must be sprayed with insecticide immediately before take-off.

-During the transport to the Community, horses cannot be unloaded in the territory of a Third Country or part of the territory that is not approved for importation of equidae into the Community (Article 6(e) of Commission Decision 2004/211). However, horses may transit without unloading in such territories (e.g. Senegal). There is a potential risk of transmission of infected vectors in AHS-infected regions to horses destined for the EU if the cargo doors are opened during transit, and if application of insect vector protection protocols are not applied consistently (information based on expert opinion).

-During the transport to the Community, horses cannot be transported on road, railway or on foot through the territory or part of the territory of a Third Country that is not approved for importation of equidae into the Community (Article 6(f) CD 2004/211).

-EU rules allow for the introduction of horses from non approved Third Countries, providing they have been resident in an approved Third Country for at least 90 days prior to shipment (so called *triangulation*). The principle behind this is that any animal infected with AHSV would show symptoms during the period of time spent in the approved Third Country and prior to entering the EU. This is considered therefore a risk mitigation strategy.

Conclusion

The risk of AHSV introduction into ROI via legal trade of live equidae from Third Countries is very low. EU regulations in place are considered sufficient to mitigate the risk posed by importing registered horses from the Metropolitan area of Cape Town.

b) Importation of live equidae from other countries within the EU

-EU regulations

Equidae in the EU are allowed to travel to any Member State as long as they are accompanied by a veterinary certificate stating that the animals are healthy and that they do not come from a territory or an area of a territory subject to disease restrictions such as AHS.

An exception to this applies to countries signing the Tripartite Agreement (TPA), by which movements of registered equidae and equidae for breeding and production are allowed between UK, Ireland and France without an official certificate, providing they are accompanied by a passport.

-AHS outbreaks reports

All European countries are currently free of AHS. The latest outbreak of AHS reported in Europe occurred in Spain due to the importation of infected zebras from Namibia. It was subsequent to these outbreaks that trade in equidae between Member States was harmonized (European Commission, 1990).

-Risk Assessment

Different considerations taken when addressing the risk posed by importation of equidae from other EU countries are:

-Countries signing the TPA are obliged to notify each other as soon as a notifiable disease is confirmed in their territory.

-If AHS is diagnosed in any of the Member States animal movement restrictions will be put in place. Some of the risk mitigation strategies to allow animal movement would include: testing, vaccination, use of quarantines, etc.

Conclusion

The risk of AHSV introduction into ROI via legal trade of live equidae from other EU country is negligible. The actual freedom status of AHS in Member States and the harmonized legislation for importation of horses from outside the EU will contribute to minimize the risk of any EU countries to acquire the disease in the first place.

2.5.2 Introduction of infected vectors

a) Wind dispersal

AHS virus is transmitted mainly by midges of the genus *Culicoides*. These arthropods are also involved as the main vectors for Bluetongue transmission. The change in the geographical distribution of the BT virus in the recent years and the realization of the role played by the wind in viral transmission has raised alarms in terms of possible incursions of other diseases by wind dispersal of infected vectors. A national Bluetongue Virus (BTV) vector surveillance programme was initiated in Ireland in 2007, with the aim of providing better knowledge of the Irish *Culicoides* species (especially BTV vector forms). To date Ireland has remained free of Bluetongue even when the disease was diagnosed in the UK. Nevertheless it is theoretically possible that if AHS was diagnosed in any neighbouring countries and provided the wind trajectories and velocities from the affected area are optimal, ambient temperatures sufficient for survival of infected parous female *Culicoides*, ambient climatic conditions suitable at landfall, and susceptible hosts present at landfall, that AHSV could be introduced into Ireland by wind dispersal of infected vectors. The prevailing South West winds in Ireland and high altitude of the mountains in Wales (Snowdonia) may however mitigate against any possible spread from the UK to Ireland.

Conclusion

The risk of AHSV introduction into ROI via wind dispersal of infected vectors is considered negligible based on the fact that AHS is confined to areas in Sub-Saharan Africa. This assessment should be reviewed in the case of an outbreak of AHS being reported in proximity countries.

b) Accidental transportation

There is a theoretical risk that blood fed female midges may roost on cut flowers or pot plants originating in a restricted zone, remain on the plants during harvesting and packaging, survive the cooling during shipping, and arrive in Ireland. However, there is no evidence from the literature that such accidental transportation of *Culicoides* has ever occurred, or that parous female midges could survive the transport conditions. Such a method of introduction was hypothesised for the original introduction of BT 8 into Europe in 2006, but no evidence was forthcoming to support the claim.

Conclusion

The risk of AHSV introduction via accidental transportation of infected vectors is considered negligible based on the current scientific knowledge of the epidemiology of the vector.

2.5.3 Importation of authorised biologicals and germplasm

a) Importation of germplasm from approved Third countries

-EU regulations

Importation of equine semen, ova and embryos is allowed from approved Third Countries as stated by Commission Decision 2004/211/EC and amending Decisions 93/195/EEC and 94/63/EC. The list of approved countries or parts of the territories requires that semen, ova and embryos are collected from equidae belonging to the category of live equidae authorised for permanent imports. Semen, ova and embryos must be collected in an approved collection centre (Commission Decision 2000/284/EC). Semen, ova and embryos have to comply with the conditions laid down in the animal health certificate as provided for in Commission Decision 2010/471/EC. During the transport, consignments of semen, ova and embryos have to be placed in closed and sealed containers and the seal must not be broken during the transport. Consignments of these commodities can not be transported in the same container as other consignments not intended for introduction into the Union, or consignments being of a lower health status.

Where specific certification requirements are laid down in a bilateral agreement between the EU and a Third Country (e.g. New Zealand, USA, Canada) those requirements shall apply.

-Risk assessment

-Equidae from which semen, ova and embryos are collected have to comply with the conditions specified in section 2.5.1 (a) of this assessment. In this section, the risk of AHSV introduction by importation of these animals was considered very low.

-Apart from assuring that the animals from which the commodities are collected pose no risk to AHSV introduction; there are strict rules to avoid possible contamination of these commodities during collection or transport.

-To date there have been no known outbreaks of AHS due to the use of infected semen, ova or embryos. Nonetheless, infected semen has been in the past the cause of transmission of other equidae viruses (i.e. Equine arteritis).

Conclusion

The risk of AHSV introduction via importation of semen, ova and embryos from Third Countries is considered negligible based on the strict measures implemented by Member States regarding importation of these commodities.

b) Importation of biologicals from approved Third Countries

-EU regulations

The trade and import conditions for equine blood and blood products for uses other than in-vivo are harmonised in EU legislation on animal by-products Commission Regulation 142/2001/EC. These products must meet certain criteria for the sourcing of the raw materials and treatments (where relevant), may only be imported from certain listed Third Countries or regions, from approved establishments, and must be accompanied by a health certificate.

Currently no approved establishments have been authorised in Third Countries to export these products to the EU.

-Risk Assessment

-The strict criteria that EU establishments have to comply with in order to achieve official certification would be applied if/when new establishments are approved in Third Countries.

-The likelihood of biologicals being contaminated would not only depend on whether the raw material is obtained from sub-clinically infected equidae but also on whether the treatment the material is subjected to is enough to destroy the virus. European rules ensure that in case of use of contaminated raw materials, approved treatments would be sufficient to destroy the virus.

Conclusion

The risk of AHSV introduction due to the importation of certified biologicals from Third Countries is considered negligible based on the strict requirements that establishments have to comply with in order to achieve certification.

c) Importation of germplasm from other countries within the EU

-EU regulations

The same regulations described in part a) of section 2.5.3 in relation to animal health certificates, collection centres and transport, apply to importation of semen, ova and embryos from other European Member States.

Conclusion

The risk of AHSV introduction via importation of semen, ova and embryos from other European Countries is considered negligible based on the strict measures implemented by Member States regarding importation of these commodities.

d) Importation of biologicals from other countries within the EU

-EU regulations

EU legislation on animal by-products (Commission Regulation 142/2011/EC) harmonises rules on the placing on the market of blood and blood products within the EU. Strict criteria for the sourcing of raw materials and possible treatments are also laid out in this piece of legislation.

Conclusion

The risk of AHSV introduction due to the importation of certified biologicals from Third Countries is considered negligible based on the strict requirements that establishments have to comply with in order to achieve certification.

3. Summary

African Horse Sickness is an infectious, non-contagious, arthropod-borne disease affecting equidae. AHSV is transmitted by midges of the genus *Culicoides*, which are also the vectors involved in Bluetongue (BT) transmission. AHS is endemic in sub-Saharan central and east Africa. The disease occasionally spreads from central to southern or northern Africa, and on certain occasions in the 20th century, outbreaks have been reported outside Africa: Middle East, Spain, Portugal, Saudi Arabia, Yemen and the Cape Verde Islands (OIE, 2011).

In this assessment we have investigated the risk of AHSV introduction into Ireland by three different means: importation of infected equidae, introduction of infected vectors and importation of infected biologicals and germplasm.

A review of the current EU legislation and appropriate regulations in terms of importation of live equidae, germplasm and biologicals was carried out, concluding that:

- The likelihood of AHSV introduction via importation of live equidae from Third Countries was considered **very low**. Based on past experiences (the latest outbreak of AHS reported in Europe occurred in Spain due to the importation of infected zebras from Namibia), importation of sub-clinically infected animals has been the most worrying concern of EU Members States. As a result of the outbreak in Spain, the movement of equidae between Member States was harmonized (European Commission, 1990). EU regulations that were put in place were reviewed in this assessment and were considered sufficient to mitigate the risk posed by importing registered horses from Third Countries and specifically from the Metropolitan area of Cape Town (this is the only part of a territory reporting outbreaks of AHS since 1995 from which importation of certain categories of horses is authorised).

- The likelihood of AHSV introduction via importation of live equidae from other Member States was considered **negligible**.

- The likelihood of AHSV introduction via germplasm and biologicals was considered **negligible**, even when those were imported from establishments based in Third Countries. The strict criteria that EU and Third Countries establishments have to comply with in order to achieve official certification are considered sufficient to keep the risk to a minimum level.

The introduction of AHS virus by infected vectors was also reviewed in this assessment and the conclusions were that:

-The likelihood of AHSV introduction by wind dispersal from neighbouring infected countries is **negligible**. This assessment is based primarily on the current confined location of the AHS virus (Sub-Saharan central and east Africa). In the case of an outbreak of AHSV in a neighboring country this assessment should be reviewed. The information collected through the National BTV vector surveillance program will then be crucial to the reviewing of the risk.

-The likelihood of AHSV introduction via accidental transportation is considered **negligible** based on the lack of evidence from the literature that such accidental transportation of *Culicoides* has ever occurred.

Although the overall risk of introduction by all three routes is considered to be **very low** at this time, the fact that AHSV could be readily spread to the Mediterranean basin if the virus reaches North Africa, the extensive international movement of equidae, and the existence of potential vectors for the virus in Ireland, it is important that owners of equidae are aware of the symptoms of the disease and take great care when importing animals.

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