USDA Animal and Plant Health Inspection Service
U.S. DEPARTMENT OF AGRICULTURE

Animal Health Status Review of Estonia

African swine fever, classical swine fever,
foot and mouth disease, and swine vesicular disease

August 2019

1. Executive summary

The Animal and Plant Health Inspection Service (APHIS) of the United States Department of Agriculture (USDA), in collaboration with the Canadian Food Inspection Agency, reviewed the animal health status of Estonia with respect to four highly contagious animal diseases: African swine fever (ASF), classical swine fever (CSF), foot and mouth disease (FMD), and swine vesicular disease (SVD). APHIS currently recognizes Estonia as low risk for CSF as part of the APHIS-defined European CSF region, and as free of FMD and SVD. APHIS recognizes only those regions of Estonia and other European Union (EU) Member States as affected with ASF that are restricted by the EU or any Member State because of detection of ASF in domestic or feral swine. We conducted this review to determine whether these animal disease statuses that APHIS recognizes for Estonia remain appropriate. This review is based on information collected from the Government of Estonia and public sources. We did not conduct a site visit to Estonia as part of this review.

The information we reviewed indicates that the official veterinary services of Estonia have sufficient legal authority and resources to carry out animal health activities efficiently and effectively. The services are hierarchically organized and have clear lines of command and reporting. Roles and responsibilities are well defined. Training programs for new and established staff are in place. Export certification responsibilities and procedures are clearly documented. Animal health controls on trade from other EU Member States and imports from third countries are well developed, organized, and documented, and are supported by extensive EU and Estonian legislative authority and infrastructure.

Estonia has robust systems in place for animal identification, premises registration, and livestock movement controls. These systems allow rapid tracing of animals in the event of disease detection. The levels and methods of ASF, CSF, FMD, and SVD surveillance are appropriate to the disease risks in the country. Reporting requirements are well documented and supported by training and educational outreach to appropriate targets. Animal disease control and emergency response measures are well developed and documented at the EU and national levels. The effectiveness of Estonia's disease control and eradication measures is demonstrated by its continued freedom from CSF, FMD, and SVD, and eradication of ASF from its domestic swine population.

In this review, we found no evidence that CSF, FMD, and SVD are present in Estonia, or that ASF is present in domestic swine in Estonia. ASF is present in wild boar in Estonia. The information we reviewed indicates that Estonia has sufficient control measures in place to limit the risk of introduction of CSF, FMD, and SVD into Estonia; and the spread of ASF into Estonia's domestic swine population and export of these diseases to the United States. Estonia's disease surveillance and emergency response measures appear to be sufficient to ensure rapid detection and control in the event of disease incursion, and prompt notification of trading partners.

We recommend based on the findings of this review, and given APHIS' current approaches to recognition of animal health statuses in Europe, that APHIS maintain the ASF, CSF, FMD, and SVD statuses that it currently recognizes for Estonia, with the associated import risk mitigations currently in place.

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3. Abbreviations

ASF	African swine fever
APHIS	Animal and Plant Health Inspection Service
ARIB	Agricultural Registers and Information Board
BIP	Border Inspection Post
CSF	classical swine fever
ELISA	enzyme-linked immunosorbent assay
EU	European Union
FMD	foot and mouth disease
OIE	World Organization for Animal Health
PCR	polymerase chain reaction
SVD	swine vesicular disease
USDA	United States Department of Agriculture
VFB	Veterinary and Food Board
VFL	Veterinary and Food Laboratory

4. Introduction

APHIS regulates the importation of animals and animal products into the United States to guard against the introduction and spread of foreign animal diseases. In support of this goal, APHIS prohibits or otherwise restricts the importation of animals and animal products from regions that APHIS recognizes as affected with ASF or does not recognize as free of CSF, FMD, and SVD, among other diseases. These four highly contagious viral diseases are exotic to the United States, and ASF, CSF, and FMD are among the World Organization for Animal Health (OIE)-listed diseases of concern for international trade [1-5]. Currently, APHIS recognizes Estonia as low risk for CSF as part of the APHIS-defined European CSF region, and as free of FMD and SVD. APHIS recognizes only those regions of Estonia and other European Union (EU) Member States as affected with ASF that are restricted by the EU or any Member State because of detection of ASF in domestic or feral swine [6].

In 2012 APHIS conducted an in-depth evaluation of Estonia's veterinary infrastructure and the CSF and SVD statuses of Estonia. In that evaluation, APHIS concluded that the legal authority and resources of Estonia's official veterinary services were sufficient for efficient and effective animal health surveillance, control, and emergency response, and that the likelihood of CSF or SVD virus introduction into the United States from Estonia through importation of susceptible animals and their products is low [7].

Periodically, APHIS conducts more general reviews of the APHIS-recognized animal health statuses of foreign regions to determine whether the conditions in the region support the continuation of APHIS' recognition of those statuses [8]. We conducted the 2019 review of the ASF, CSF, FMD, and SVD statuses of Estonia as part of that review program. Separately but in conjunction with this status review of Estonia, APHIS is evaluating the animal health statuses of 12 other European Union (EU) Member States; the ASF and CSF control measures in place in the EU and EU Member States; and APHIS' approaches to the recognition of animal health statuses in Europe and whether those approaches remain appropriate. Details and findings of those evaluations will be published separately from this report.

The primary objective of APHIS animal health status reviews is to determine, for each disease under evaluation, whether the region meets the overarching standards listed below, with respect to specified disease agents, referred to here as hazards:

1. The hazard is unlikely to be present in the region and/or commodities under review.
2. The hazard is unlikely to infect or contaminate commodities intended for export to the United States.
3. If the hazard were introduced into the region, the region would rapidly detect it; promptly notify the United States and/or the OIE of the introduction; and respond to the introduction to mitigate the risk of introduction of the hazard into the United States through importation of susceptible species and products of those species.

The sources of the information we evaluated in this review include the Government Estonia, the OIE website, and other public sources. We collected information from Estonia through use of a standardized questionnaire developed for APHIS animal health status reviews. A site visit to Estonia was not needed as part of this review, as the provided information, along with details obtained on previous site visits, allowed a thorough review of the current situation in that country.

The results of this review are expected to inform APHIS management decisions regarding the ASF, CSF, FMD, and SVD statuses of Estonia and whether to amend restrictions on the importation of relevant commodities from Estonia.

Most of the information in this report is current as of August 2019, when the draft report was completed. APHIS added minor clarifications in April 2020 in response to comments from Estonia on the draft report.

5. Scope of the review

The disease scope of this review is limited to ASF, CSF, FMD, and SVD. All four diseases affect swine. FMD also affects other cloven-hoofed mammals including cattle, sheep, and goats; however, given the current presence of ASF in Europe, this review is focused on swine. The hazards under consideration in this review are the viruses that cause ASF, CSF, FMD, and SVD.

The geographic scope of this review is limited to the Republic of Estonia. Estonia is located in northern Europe. It is bordered to the east by Russia, to the south by Latvia, to the west by the Baltic Sea, and to the north by the Gulf of Finland (Figure 5-1) [9].

Figure 5-1. Map of Estonia.

6. Status of hazards under review in Estonia

ASF was first introduced into Estonia in 2014, when it was detected in wild boar in Valga county [10]. In 2015, it spread to domestic swine [11]. It was last detected in domestic swine in 2017, and is currently still present in wild boar [11-13]. Information about ASF control and eradication measures in Estonia is provided in section 9.4.

CSF last occurred in domestic swine in Estonia in 1994 and has never been detected in feral swine in Estonia [13-15]. FMD last occurred in Estonia in 1982, in domestic livestock and in wildlife [13, 16-18]. SVD has never been detected in Estonia [13, 19].

Routine vaccination for ASF, CSF, FMD, and SVD is not conducted in Estonia [20]. Emergency vaccination is permitted only under exceptional circumstances to prevent disease spread and only in accordance with established official disease eradication rules.

7. Veterinary control and oversight

7.1 Legal authority for animal health activities

The primary Estonian legal act that provides authority for the official veterinary services is the Veterinary Activities Organization Act [21]. This act defines the organization and scope of responsibilities of the Estonian veterinary services, and provides authority necessary for prevention, control, and eradication of infectious animal diseases. Legal authorities and veterinary requirements for trade in animals and animal products with other EU Member States and imports and exports with third countries are set forth in the Trade in, Import, and Export of Animals and Animal Products Act [22]. These and other Estonian legal instruments that provide Estonia's official veterinary services the necessary authority and mandates for a variety of animal health activities are listed in the Appendix. Covered animal health activities include disease surveillance; on-farm inspection; animal identification and premises registration; disease control and eradication activities; and import, export, and internal movement control activities. The full texts of Estonian animal health legislation, including English translations of many relevant legal acts, are available on the website of the government of Estonia [23].

As a Member State of the EU, Estonia is bound by all applicable EU Regulations, Decisions, and Directives, including those related to animal health and control of infectious animal diseases [24, 25]. EU animal health legislation is available on the European Commission website [26].

7.2 Organizational structure of the veterinary services

The national animal health authority of Estonia is the Veterinary and Food Board (VFB), which is part of the Ministry of Rural Affairs [13]. The VFB is responsible for enforcing and supervising the implementation of legislation governing animal health, food safety, market regulation, animal welfare, and farm animal breeding. An organizational chart of the VFB is shown in Figure 7-1.

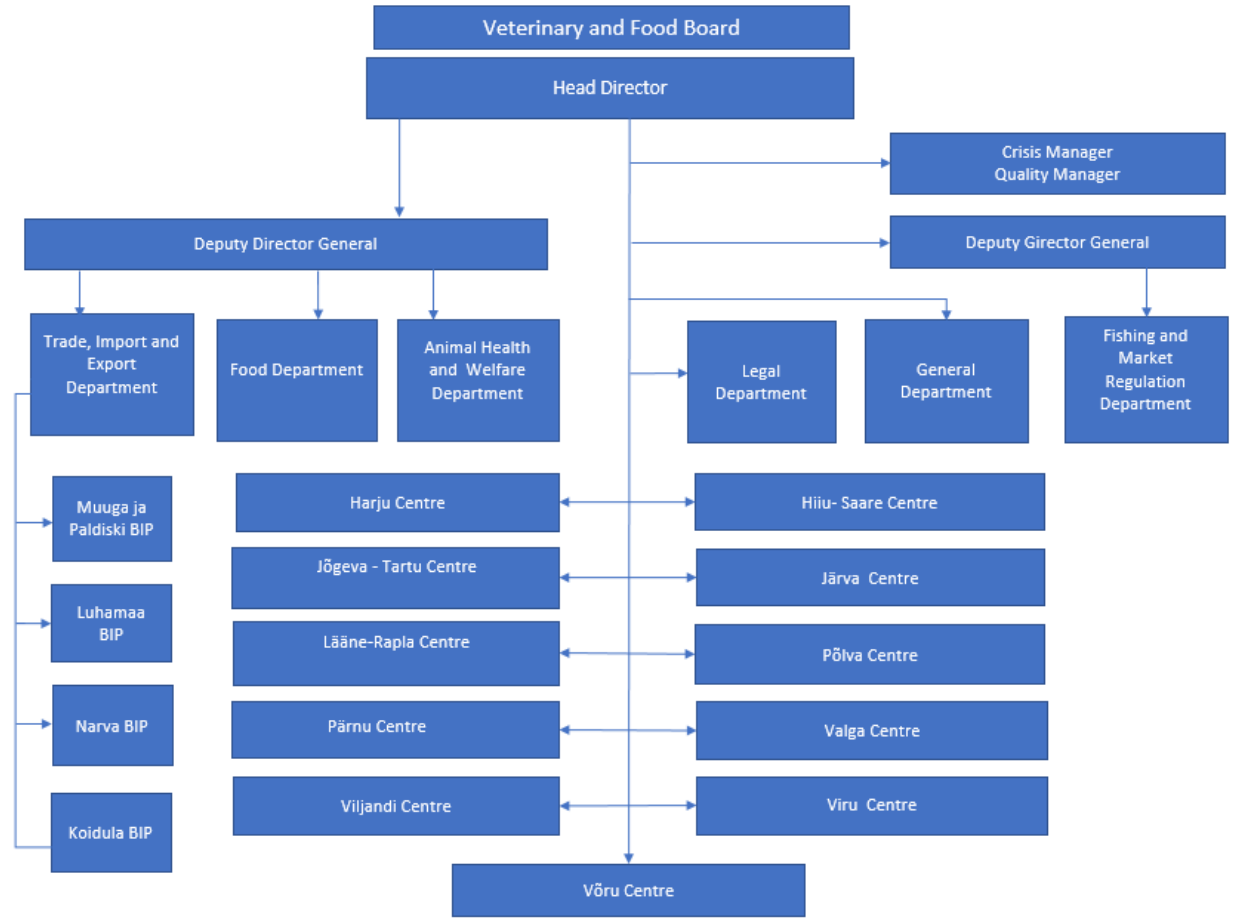

Figure 7-1. Organizational chart of the VFB.

The central office of the VFB is organized into several departments, each with defined responsibilities. Animal health related responsibilities are delegated primarily to the Animal Health and Welfare Department. Trade, import, and export responsibilities are delegated to the Trade, Import, and Export Department. The VFB coordinates animal health activities at the local level through county offices, which report directly to the head of the VFB (Figure 7-2).

Figure 7-2. Locations of central and local veterinary offices.

The state veterinary laboratory in Estonia is the Veterinary and Food Laboratory (VFL), which reports directly to the Ministry of Rural Affairs. The VFL is headquartered in Tartu [13, 27]. Three smaller VFL laboratories are located in Tallinn, Rakvere and Saaremaa. Additional information about the VFL is provided in section 9.2.

7.3 Infrastructure and financial resources

The official veterinary services of Estonia employ a total of 198 veterinarians and 7 veterinary technicians [13]. All of the veterinary technicians and more than 60 percent of the veterinarians are employed at the local level. The remainder of the veterinarians are employed at the central level, and in border control and laboratory services.

As of March 2019, Estonia had 793 private veterinarians 29 authorized veterinarians [13]. Authorized veterinarians are contracted with the VFB to help monitor for animal diseases and collect tissue samples for national infectious animal disease control programs, in accordance with provisions of the Veterinary Activities Organization Act.

The VFB has documented training programs for new and established staff, and for authorized veterinarians [13, 20]. Training is carried out in accordance with an annual training plan developed by the VFB and consists of theoretical and practical components. VFB officials that conduct export certification receive continuing training on import requirements of importing countries. The VFB also conducts and participates in emergency preparedness and response

exercises at the local, national, and international levels [13]. Exercises in recent years have included several ASF and FMD response exercises.

The official veterinary services in Estonia are funded primarily through the Estonian state budget [20]. In addition, EU funding is available for various national disease surveillance, control, and eradication programs, including for ASF.

7.4 Export controls

VFB responsibilities include ensuring that export certification requirements of trading partners are met [13]. General veterinary requirements for trade of animals and animal products to other EU Member States or export to third countries are specified in the Trade in, Import, and Export of Animals and Animal Products Act [22]. Consignments for trade or export must comply with all applicable requirements of the EU, Estonia, and the receiving country. Consignments for export are subject to inspection by the VFB at the place of origin for compliance with animal health and export requirements. These inspections include document, identity, and clinical checks as appropriate, and are guided by the use of formal checklists [28]. Except in the case of consignments transiting Estonia, animals and animal products for export must be transported under customs supervision from the time the consignment is established until it reaches its point of its exit from the EU.

Detailed procedures for export and trade of animals and animal products are documented by VFB Directive [13, 28]. Only VFB officials authorized by the head of the VFB are eligible to issue export certificates. Certifying officials are required to be knowledgeable about export requirements and are prohibited from attesting to information that they have not verified and from having any direct commercial interest in the certification.

Exporters or their authorized representatives must apply in writing to their local VFB office for an export certificate at least 24 hours (for animal products) or 48 hours (for animals) prior to export. If necessary, to verify compliance with export requirements, the application must include supporting documentation, such as veterinary health certificates, journey logs, or test reports. Certificates are printed on numbered certification forms with security features. The certificate must specify the issuing office, sender, and recipient; and provide information about the goods to be exported, including description, origin, place of loading, identification number, storage and transport conditions, and point of exit from the EU.

A certificate is not issued if the consignment does not meet export requirements, cannot be physically checked, or does not comply with information specified in the application documents. Other reasons for refusal to issue a certificate are if the application includes falsified information, or the applicant has previously forged or altered a certificate. Certificates are revoked if the consignment is not exported. Certificates and supporting documentation are maintained in the VFB office for three years from date of issuance.

7.5 Conclusions

The information we reviewed indicates that the official veterinary services of Estonia have sufficient legal authority and resources to carry out animal health activities efficiently and effectively. The services are hierarchically organized and have clear lines of command and reporting. Roles and responsibilities are well defined. Training programs for new and established staff are in place. Export certification responsibilities and procedures are clearly documented.

8. Barriers to hazard entry into Estonia

Most of Estonia is surrounded by large bodies of water (Figure 5-1). Its only land borders are with EU Member State Latvia to the south, and Russia to the east.

8.1 Controls on intra-EU trade

Estonia has been a member of the EU since 2004 [29]. A key policy of the EU is the establishment and functioning of an internal market that provides for, among other things, the free movement of persons and goods, including agricultural products, among Member States [25].

In general, movement of animals and animal products among EU Member States cannot be limited or prohibited except when such restrictions have been imposed by the EU on animal or public health grounds [30, 31]. Swine, cattle, sheep, and goats for intra-EU trade must be identified in accordance with applicable legislation, be accompanied by a health certificate, not show clinical signs of disease, and not originate from a holding that is subject to animal disease-related restrictions [31-35].

To decrease the likelihood of spread of highly contagious animal diseases among EU Member States to other Member States, the EU has developed measures that are disease specific and specific to affected Member States [36, 37]. In general, these measures apply in addition to the animal health control measures applicable to all EU Member States. The measures, and the Member States or regions of Member States to which they apply, are specified in Commission Decisions that are updated regularly as the disease situation in the EU changes. Among the measures are additional restrictions on movement of swine both to other Member States, and within affected Member States; additional requirements for serological testing and clinical examination for disease; and additional animal health certification requirements.

8.2 Controls on imports from third countries

Estonia follows EU requirements for importation of animals and animal products from third countries [13]. EU legislation governing importation of animals and animal products into the EU from third countries is “designed to ensure that imported animals and products meet standards at least equivalent to those required for production in, and trade between Member States” [38]. In general, animals and animal products can be legally imported into the EU only from third countries or parts thereof that are approved for export to the EU by EU legislation, and only through approved Border Inspection Posts (BIPs) [18]. In most cases, evaluation of a country's application for approval involves an on-site inspection by the audit unit of the EU Directorate-General for Health and Food Safety, to determine whether the animal health situation and relevant official services, legal provisions, control systems, and production standards meet EU requirements.

Animals and animal products for importation into the EU must be accompanied by a health certificate signed by an animal health official [38]. The certificate specifies the animal health conditions that must be satisfied, including required veterinary checks; these conditions are specific to each category of animal or product. Animals and animal products for import are subject to veterinary checks at the border, including document and identity checks [38-42]. Physical checks are carried out based on the risk profile of the commodity and the results of previous checks. The veterinary checks are authorized by EU legislation to be performed only at

BIPs approved for such documentary and identity checks [18]. The BIPs are inspected regularly by European Commission veterinary experts, who review compliance with EU legislation on import controls at the BIPs. The scope of these inspections includes all aspects of implementation of EU legislation on veterinary import control, including infrastructure, equipment, and procedures. The requirements for entry or transit of animal commodities are clearly documented in EU legislation [39-42].

Estonia has five BIPs: at Luhamaa and Narva at road border crossings between Estonia and Russia; at Koidula, at a rail border crossing between Estonia and Russia; and at Muuga and Paldiski, at seaports on the northern coast of Estonia [13, 43]. All five BIPs are authorized to accept animal products. Only the BIP at Luhamaa is authorized to accept live animals.

At all entry points into Estonia, the Tax and Customs Board is responsible for stopping vehicles and referring them for veterinary checks if necessary, and for controls of personal luggage [13]. The VFB is responsible for the controls of livestock vehicles. Consignments that are determined to be noncompliant with import requirements are refused entry or destroyed, and the disposition is documented.

8.3 TRACES

All EU Member States are required to participate in the Trade Control and Expert System (TRACES), a multilingual electronic system developed and maintained by the European Commission for transmission, storage, and management of veterinary information relating to trade in animals and products of animal origin, for both intra-EU trade and imports from countries outside the EU [44-48]. Animal trade-related information available through TRACES includes animal health, import, and export certificate data. Users include competent authorities for animal health and commercial entities in all Member States as well as more than 50 non-EU countries, including the United States.

8.4 Conclusions

Estonia is physically separated from potential sources of infection by large bodies of water to the north, east, and west. Animal health controls on trade from other EU Member States and imports from third countries are well developed, organized, and documented, and are supported by extensive EU and Estonian legislative authority and infrastructure.

9. Hazard detection, response, and notification

9.1 Livestock demographics and traceability

Premises registration and livestock identification are mandatory in Estonia [13, 20]. All livestock owners are required to guarantee the identifiability of their animals, in accordance with applicable legislation and officially specified procedures and methods [13, 20]. Bovines must be identified by 20 days of age, and ovines and caprines must be identified by 6 months of age. Swine are identified by ear tag or tattoo as to premises of birth. All livestock must be identified and registered prior to movement.

Livestock keepers are required to maintain a record of information on livestock kept on the premises, including the animal's date of birth, sex, and breed; the dates of arrival and departure (or death) of the animal; and the names and contact information of buyers and sellers of the

animals [13, 20]. VFB personnel verify animal identification and the accuracy of data maintained by the animal keeper and in the national registry (see below) through on-farm inspections in accordance with written guidelines issued annually by the VFB.

Livestock and livestock premises registry information is collected and maintained at a national level in an electronic database by the Agricultural Registers and Information Board (ARIB) of the government of Estonia [49]. Animal keepers are required to notify ARIB within 7 days of animal identification or movement [13, 20].

In general, domestic swine in Estonia are moved directly from source to destination premises [13, 18, 20]. Animal movements must be accompanied by a veterinary certificate, which states that the animals are clinically healthy and eligible for transport, and not subject to movement restrictions related to infectious disease. For animals moved to slaughter, the herd owner must inform the local VFB office and the slaughterhouse of such movements in advance.

The penalty system for noncompliance with animal identification, premises registration, and record-keeping requirements begins with written notification of noncompliance, with a specified deadline and requirements to be met for compliance [20]. Further noncompliance, or improper compliance, is subject to additional written violations and fines or misdemeanor proceedings.

The numbers of swine and swine herds in Estonia have decreased substantially in recent years, as shown in Table 1.

Table 1. Numbers of swine and swine herds in Estonia, 2015-2017.

	2015		2016		2017	
Herd size (head)	Number of herds	Number of swine	Number of herds	Number of swine	Number of herds	Number of swine
1-10	488	1,626	94	418	17	82
11-100	95	2,644	54	1,665	29	992
101-1000	36	14,930	29	12,498	18	9,296
>1000	82	360,307	71	320,511	63	279,593
Total	701	379,507	248	335,092	127	289,963

Most of the decrease is accounted for by large decreases in the number of premises with 10 or fewer swine. Feeding of catering waste to farmed animals (except those used for the production of fur) is prohibited in Estonia [20, 50].

9.2 Disease detection

Laboratory testing for ASF, CSF, FMD, and SVD in Estonia is conducted by the VFL, in accordance with documented standard operating procedures [13, 27]. The VFL is the national reference laboratory for ASF, CSF, FMD, and SVD, and is accredited by the Estonian Accreditation Center in accordance with EVS-EN ISO/IEC 17025. The VFL has documented quality control procedures in place, including use of secondary reference materials, participation in inter-laboratory comparison programs, and retesting of retained samples.

Test methods for ASF available at the VFL are enzyme-linked immunosorbent assays (ELISAs), immunoperoxidase testing, immunoblotting, real-time polymerase chain reaction (PCR), and nucleotide sequencing [13, 18]. For CSF, the laboratory performs ELISAs, virus isolation, and real-time reverse transcription (RT) PCR. For FMD and SVD, the laboratory performs ELISAs and real-time RT-PCR.

Surveillance for ASF, CSF, FMD, and SVD in Estonia is conducted in accordance with an annual national infectious animal disease control program developed by the VFB [13, 20]. The surveillance plan for ASF in domestic swine provides for virological (PCR) testing of any swine suspected of having ASF, and of the first two carcasses each week of swine over 2 months old that were found dead within the previous 36 hours. Swine herds that are located in specified restricted areas (any area listed in part II or III of the annex to Commission Implementing Decision 2014/709/EU, indicating ASF infection in domestic swine and/or wild boar; see section 9.4) are subject to movement restrictions and testing requirements as provided for in EU legislation. These restrictions and requirements include that swine from such areas be virologically tested within 15 days prior to movement within or out of the area, including movements to slaughter. Alternatively, swine for dispatch from any area listed in part II must come from a farm that has been subjected to clinical examination and virological (PCR) testing of its swine by the competent veterinary authority at least twice per year and that meets biosecurity standards established by the VFB, as determined by VFB inspection. Lists of farms that meet the relevant requirements are maintained on the VFB website [18, 37, 51].

All wild boar hunted in areas listed in part II or III of the annex to Commission Implementing Decision 2014/709/EU (see section 9.4), as well as approximately 50 percent of wild boar hunted in areas listed in part I (indicating areas in proximity to ASF infection) and those removed from any area listed in part I, are tested for ASF. The samples are tested virologically and, if ASF has already been detected in the area, serologically (by ELISA). All wild boar found dead are tested virologically and, if ASF has already been diagnosed in the area, serologically.

The surveillance results for ASF in Estonia for the past three years are listed in Table 2.

Table 2. ASF surveillance results, 2016-2018.

	Number of animals tested		Number of positive animals	
Year	Domestic swine	Wild boar	Domestic swine	Wild boar
2016	9,987	31,209	54	1,700
2017	12,102	19,206	120	972
2018	7,677	10,140	0	311

The surveillance plan for CSF and SVD in domestic swine is designed to detect infection at 10 percent prevalence with a likelihood of 95 percent [13]. The numbers of herds and animals to be tested in each county are specified in the surveillance plan. All herds with at least 10 sows or 100 fattening pigs are tested at least twice per year, with a minimum interval of 4 months. All boar at Estonia's artificial insemination center are serologically tested twice per year. All hunted wild boar are serologically tested for CSF. All wild boar found dead are tested virologically and, if CSF has already been diagnosed in the area, serologically.

The surveillance results for CSF in Estonia for the past three years are listed in Table 3. All results were negative.

Table 3. CSF surveillance results, 2016-2018.

	Number of animals tested		Number of positive animals
Year	Domestic swine	Wild boar	
2016	2,168	15,123	0
2017	3,809	9,236	0
2018	4,098	4,911	0

The numbers of domestic swine tested for SVD in 2016, 2017, and 2018 are 2118, 3743, and 4107, respectively [13]. All results were negative.

The FMD surveillance plan provides for FMD antibody testing of 10 percent of blood samples submitted for bluetongue testing [13]. This is achieved by testing every tenth sample submitted. In the past three years, approximately 150 samples were tested each year for FMD; all results were negative.

Suspected cases of ASF, CSF, FMD, and SVD are investigated by the VFB in accordance with requirements and procedures specified in the Infectious Animal Disease Control Act and disease-specific prevention and control regulations [13]. In the past 3 years, one suspected case of FMD was reported each year. Each case was investigated, including further laboratory testing, with negative results. No suspected cases of CSF and SVD were reported in the past 3 years.

9.3 Disease reporting

Reporting to the VFB of any suspected occurrence or diagnosis of any notifiable disease, including ASF, CSF, FMD, and SVD, in Estonia is mandated by law [13, 52]. Animal keepers are required to inform a veterinarian immediately of the death of any bovine over 24 months of age or any ovine or caprine over 18 months of age, or of widespread disease or death of animals. Veterinarians are required to immediately notify the VFB or an authorized veterinarian and the animal keeper of any suspected occurrence of any notifiable disease. Veterinary laboratories are required to promptly notify the VFB of suspected or confirmed laboratory diagnosis of any notifiable disease. The VFB is required to notify the OIE, the European Commission, the animal health authorities of EU Member States, and the countries neighboring Estonia of the outbreak of an infectious animal disease subject to international notification requirements, in accordance with EC and Estonian legislation.

The VFB conducts outreach activities designed to increase awareness and reporting of highly infectious animal diseases among producers, other animal keepers, official and private veterinarians, and the general public [20]. These activities include holding training sessions, seminars, and information days, and publishing informational bulletins, and are carried out in accordance with a working plan developed approximately every year and involving the national and county veterinary offices.

9.4 ASF control and eradication

ASF control measures are documented in Estonian regulations [13, 20]. Biosecurity requirements apply to all swine holdings, both commercial and noncommercial. All swine keepers must develop a biosecurity plan. All swine must be kept indoors; the premises must have fencing to prevent contact with wild boar; disinfection barriers must be present at farm entrances; biosecurity guidance must be provided to farm visitors; vehicles transporting animal byproducts are prohibited from entering the farm; people must change clothing and use appropriate disinfection measures upon entering and leaving the swine holding; forage feeding is prohibited; feed must be heat treated or stored for 30 days prior to use; bedding must be stored for 90 days prior to use; and swill feeding is prohibited. Implementation of biosecurity measures is verified through inspections by official veterinarians using standardized checklists. These inspections are conducted on all pig holdings twice per year, at an interval of at least 4 months between inspections.

ASF-specific emergency response measures in the EU are mandated by EU legislation that specifies notification requirements, and actions that must be taken in response to suspected or confirmed occurrence of ASF [53]. In addition, in response to the outbreaks of ASF in the EU beginning in 2014, the EU implemented a regionalization-based system of ASF control measures. This approach is designed to prevent the spread of ASF and eradicate it from affected regions [54]. The measures are harmonized across the EU and tailored to the Member States, taking into account local factors such as domestic swine and wild boar demographics. The measures, and the lists of geographic regions to which they apply, are amended as the epidemiologic situation changes [37]. The geographic regions are listed by group in Parts I-IV of the Annex to the applicable legislation. The groupings are based on defined level of risk: proximity to infection (part I), infection in wild boar only (part II), infection in domestic swine and wild boar (part III), and endemic disease with significant control challenges (part IV) [55]. As of May 2018, all of Estonia is listed in part II, except the island county of Hiiu, which is listed in part I [13, 37].

Estonia’s emergency response measures for ASF incorporate EU requirements and are documented in Estonia’s ASF control rules [13, 20]. In the event of suspected occurrence of ASF in domestic swine, the health statuses of all swine on the premises must be documented; the swine must be confined; no swine may enter or leave the holding; no swine meat, semen, ova, or embryos, or feed or other fomites that are likely to transmit ASF, may leave the holding without authorization from the competent authority; and people and vehicles may not move on or off the premises without authorization from the competent authority.

Upon official diagnosis of ASF in domestic swine in Estonia, the VFB establishes a protection zone of 3 km radius and a surveillance zone of 10 km radius around the affected premises, and the premises is placed under additional restriction [20]. All swine on the premises must be killed and carcasses disposed of under official supervision; sufficient samples must be collected, in accordance with documented procedures, to help determine the means and timing of introduction of the virus; meat, semen, ova, and embryos of swine derived from swine since the probable date of virus introduction must be traced; all fomites likely to be contaminated with virus must be disposed of in accordance with instructions from the official veterinarian; and the premises and vehicles must be appropriately cleaned and disinfected. An official investigation is carried out to identify the approximate date, source, and means of introduction of the virus. Swine are not to be

reintroduced onto the holding until 40 days after cleaning and disinfection. During the most recent ASF outbreaks in domestic swine in Estonia, the premises were depopulated of swine through application of lethal gas, and the carcasses were destroyed by rendering.

The VFB attributes the eradication of ASF from domestic swine in Estonia to several factors: strict biosecurity requirement for all swine farms, regardless of size; official inspection of premises to verify implementation of biosecurity requirements; VFB training, awareness campaigns, posters, and information days for hunters and farmers; a decrease in the number of ASF positive wild boar, achieved through selective hunting, carcass collection, and other control measures, resulting in a decrease in virus load in the environment; financial support for farmers to erect fencing around farms; and compensation for swine keepers for terminating operations.

9.5 Conclusions

Estonia has robust systems in place for animal identification, premises registration, and livestock movement controls. These systems allow rapid tracing of animals in the event of disease detection. The levels and methods of ASF, CSF, FMD, and SVD surveillance are appropriate to the disease risks in the country. Reporting requirements are well documented and supported by training and educational outreach to appropriate targets. Animal disease control and emergency response measures are well developed and documented at the EU and national levels. The effectiveness of Estonia's disease control and eradication measures is demonstrated by its continued freedom from CSF, FMD, and SVD, and eradication of ASF from its domestic swine population.

10. Conclusions and recommendations

In this review, we found no evidence that CSF, FMD, and SVD are present in Estonia, or that ASF is present in domestic swine in Estonia. ASF is present in wild boar in Estonia. The information we reviewed indicates that Estonia has sufficient control measures in place to limit the risk of introduction of CSF, FMD, and SVD into Estonia; and the risk of spread of ASF into Estonia's domestic swine population and export of these diseases to the United States. Estonia's disease surveillance and emergency response measures appear to be sufficient to ensure rapid detection and control in the event of disease incursion, and prompt notification of trading partners.

We recommend based on the findings of this review, and given APHIS' current approach to recognition of animal health statuses in Europe, that APHIS maintain the current ASF, CSF, FMD, and SVD statuses that it currently recognizes for Estonia, with the associated import risk mitigations currently in place.

11. Appendix

Estonian legal instruments providing authority to conduct animal health activities

The table below was provided by the government of Estonia [13]. Links to English translations are provided for legal acts. Links to the original Estonian documents are provided for disease-specific rules and one regulation.

Animal Health Activity	Description	Authorizing Legal Act(s) or Regulation(s)	Date(s) Authorizing Legal Act(s) or Regulation(s) Last Amended
Disease notification	This Act provides measures for infectious animal disease control and regulates the application of such measures and payment of compensation for damage caused by infectious animal diseases	Infectious Animal Disease Control Act	Last amended 01.01.2019
On-farm inspections	This Act provides the grounds for the organisation of veterinary activities. Veterinary activities are a system of measures applied to protect animal and human health and to ensure the welfare of animals that includes activities in the areas of animal health, animal product hygiene and animal protection. Veterinary activities include steps taken in the course of state veterinary supervision (hereinafter veterinary supervision), in the course of veterinary checks carried out in the framework of proceedings for granting activity and other licenses (hereinafter veterinary checks) and in the course of veterinary practice.	Veterinary Activities Organisation Act	Last amended 01.01.2019
Import, export, and internal movement controls	This Act provides veterinary requirements for the trade in animals and animal products with the Member States of the	Trade in, Import and Export of Animals and Animal Products Act	Last amended 01.01.2019

	European Union, veterinary requirements for the import of animals and animal products from states remaining outside of the customs territory of the European Union and for the export thereof to third countries, the grounds of and procedure for exercising veterinary supervision and carrying out veterinary checks		
Quarantine of animals or farms	This Act provides measures for infectious animal disease control and regulates the application of such measures and payment of compensation for damage caused by infectious animal diseases. The infectious animal disease control rules will lay down requirements regarding measures for prevention and control of infectious animal diseases, including regarding handling products derived from diseased animals usually in the event of an extremely dangerous. infectious animal disease and another animal disease the requirements of whose prevention and control have been set out in the relevant legislation of the European Union.	Infectious Animal Disease Control Act FMD control rules ASF and CSF control rules Certain diseases control rules including SVD	Last amended 01.01.2019 Last amended 01.04.2018 Last amended 01.05.2018 Last amended 01.04.2018
Vaccination for the disease(s) under review	This Act provides measures for infectious animal disease control and regulates the application of such measures and payment of compensation for damage caused by infectious animal diseases. The infectious animal disease control rules will lay down requirements regarding measures for prevention and control of	Infectious Animal Disease Control Act Infectious Animal Disease Control Act FMD control rules ASF and CSF control rules Certain diseases control rules including SVD	Last amended 01.01.2019 Last amended 01.04.2018 Last amended 01.05.2018 Last amended 01.04.2018

	infectious animal diseases, including regarding handling products derived from diseased animals usually in the event of an extremely dangerous infectious animal disease and another animal disease the requirements of whose prevention and control have been set out in the relevant legislation of the European Union.		
Surveillance for the disease(s) under review	This Act provides measures for infectious animal disease control and regulates the application of such measures and payment of compensation for damage caused by infectious animal diseases. The infectious animal disease control rules will lay down requirements regarding measures for prevention and control of infectious animal diseases, including regarding handling products derived from diseased animals usually in the event of an extremely dangerous infectious animal disease and another animal disease the requirements of whose prevention and control have been set out in the relevant legislation of the European Union.	Infectious Animal Disease Control Act Infectious Animal Disease Control Act FMD control rules ASF and CSF control rules Certain diseases control rules including SVD	Last amended 01.01.2019 Last amended 01.04.2018 Last amended 01.05.2018 Last amended 01.04.2018
Control and eradication of the disease(s) under review	This Act provides measures for infectious animal disease control and regulates the application of such measures and payment of compensation for damage caused by infectious animal diseases. The infectious animal disease control rules will lay down requirements regarding measures for prevention and control of	Infectious Animal Disease Control Act Infectious Animal Disease Control Act FMD control rules ASF and CSF control rules Certain diseases control rules including SVD	Last amended 01.01.2019 Last amended 01.04.2018 Last amended 01.05.2018 Last amended 01.04.2018

	infectious animal diseases, including regarding handling products derived from diseased animals usually in the event of an extremely dangerous infectious animal disease and another animal disease the requirements of whose prevention and control have been set out in the relevant legislation of the European Union.		
Animal identification and farm registration	This Act provides measures for infectious animal disease control and regulates the application of such measures and payment of compensation for damage caused by infectious animal diseases. The list of species of farm animals that are subject to identification, the method and procedure for the identification and registration of such animals, the manners of and procedure for registration of the data of farm animals, the procedure for issue of registration certificates and the format of cattle passports and the rules of accounting farm animals.	Infectious Animal Disease Control Act The regulation of Ministry of Agriculture no 128 21.12.2009	Last amended 01.01.2019 Last amended 08.04.2016
Emergency response activities	This Act provides measures for infectious animal disease control and regulates the application of such measures and payment of compensation for damage caused by infectious animal diseases. This Act provides for the legal bases for crisis management, including preparing for and resolving an emergency as well as ensuring the continuity of vital services. This Act also governs the	Infectious Animal Disease Control Act Emergency Act	Last amended 01.01.2019 Last amended 01.07.2018

	declaration, resolution and termination of an emergency situation, the involvement of the Defence Forces and the Defence League in resolving an emergency that has led to the declaration of an emergency situation, and state supervision and liability.		
Seizure, depopulation, and compensation	This Act provides measures for infectious animal disease control and regulates the application of such measures and payment of compensation for damage caused by infectious animal diseases. The infectious animal disease control rules will lay down requirements regarding measures for prevention and control of infectious animal diseases, including regarding handling products derived from diseased animals usually in the event of an extremely dangerous infectious animal disease and another animal disease the requirements of whose prevention and control have been set out in the relevant legislation of the European Union.	Infectious Animal Disease Control Act Infectious Animal Disease Control Act FMD control rules ASF and CSF control rules Certain diseases control rules including SVD	Last amended 01.01.2019 Last amended 01.04.2018 Last amended 01.05.2018 Last amended 01.04.2018

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