GUIDELINES FOR REPORTING NOTIFIABLE DISEASES

2019 Edition

Contents

GENERAL INFORMATION 3

ACTIONS TAKEN BY THE NPARKS/AVS 3

REPORTING NOTIFIABLE DISEASES AND SUBMISSION OF SAMPLES 4

NOTIFIABLE DISEASES CLASSFIED ACCORDING TO AFFECTED SPECIES 5

OVERVIEW OF REPORTING CRITERIA AND TIMEFRAMES FOR NOTIFIABLE DISEASES 9

Schedule of Notifiable Diseases 14

Part A1: Diseases of mammals and birds (Notify within 24 hours) 14

Part A2: Diseases of mammals and birds (Notify within 72 hours) 37

Part B1: Diseases of Aquatic Animals and Amphibians (Notify within 24 hours) 91

Part B2: Diseases of Aquatic Animals and Amphibians (Notify within 72 hours) 92

GENERAL INFORMATION

Notifiable diseases refer to those listed in the Schedule of the Animals and Birds (Disease) Notification. The list of notifiable diseases is based on the list of diseases that are notifiable to the World Organisation for Animal Health (OIE), and also includes diseases that are of a national significance. The diseases cover a range of animal species, some of which have zoonotic potential. It applies to diseases detected in locally obtained, imported and exported samples of animal or bird origin.

Notifiable diseases are important, as they may have an impact on public health, animal health, and trade in animals and animal products. Owners or persons-in-charge of animals suspected or confirmed to be infected with a notifiable disease have a legal obligation to report the case to the National Parks Board/Animal & Veterinary Service (NParks/AVS). This ensures that incursions of exotic diseases, or diseases of public health impact are promptly detected and investigated.

This document provides guidance on identifying and diagnosing notifiable diseases, including the reporting timeframes and criteria for reporting to guide how promptly and on what basis the suspect or confirmed cases should be reported. The guidelines have been developed in reference to the World Organisation for Animal Health (OIE) Terrestrial and Aquatic Animal Health Codes and Manuals. Further information on diseases may be found on the OIE website (www.oie.int).

For information on the occurrence of diseases globally, refer to the OIE World Animal Health Information Database (WAHID) interface: http://www.oie.int/wahis/public.php?page=home

ACTIONS TAKEN BY THE NParks/AVS

Actions taken by NParks/AVS will depend on the nature of the disease being reported (e.g. agent involved, population(s) affected, presenting signs). NParks/AVS may conduct an investigation to request for further information on the case(s). Follow-up measures can range from the issuance of an advisory to guide the establishment or animal owner on management measures, isolation or movement restriction notice, collection of samples for diagnostic testing, and directives for disease control measures.

REPORTING NOTIFIABLE DISEASES AND SUBMISSION OF SAMPLES

Any notifiable disease must be reported to NParks/AVS based on the criteria in this document. Any unusual morbidity and mortality events should also be reported to NParks/AVS, even if the presumptive diagnosis is uncertain.

Information on reporting notifiable diseases, including the template for notification may be found at: https://www.nparks.gov.sg/avs/animals/animal-health-and-veterinarians/animal-diseases-and-antimicrobial-resistance/reporting-notifiable-diseases For after-hours reporting, please call the hotline 1800 476 1600. For queries on submission on samples, please contact 6316 5178.

NOTIFIABLE DISEASES CLASSFIED ACCORDING TO AFFECTED SPECIES

Cattle		**Sheep and goats**	
Anthrax [Z]	Infectious bovine rhinotracheitis	Anthrax [Z]	Nairobi sheep disease
Aujeszky's disease	Leptospirosis [Z]	Aujeszky's disease	New world screwworm (*Cochliomyia hominivorax)* [Z]
Black quarter (blackleg)	Listeriosis [Z]	Black quarter (blackleg)	Old world screwworm (*Chrysomya bezziana*) [Z]
Bluetongue	Lumpy skin disease	Bluetongue	Ovine pulmonary adenocarcinoma
Bovine anaplasmosis	Lyme disease [Z]	Bovine genital campylobacteriosis [Z]	Paratuberculosis
Bovine babesiosis	Melioidosis [Z]	Bovine tuberculosis [Z]	Peste des petits ruminants
Bovine brucellosis [Z]	Marburg disease [Z]	Caprine arthritis/encephalitis	Q fever [Z]
Bovine genital campylobacteriosis [Z]	New world screwworm (*Cochliomyia hominivorax)* [Z]	Caprine/ovine brucellosis [Z]	Rabies [Z]
Bovine malignant catarrhal fever	Old world screwworm (*Chrysomya bezziana*) [Z]	Contagious agalactia	Rift Valley fever [Z]
Bovine spongiform encephalopathy [Z]	Paratuberculosis	Contagious caprine pleuropneumonia	Rinderpest
Bovine tuberculosis [Z]	Q fever [Z]	Echinococcosis/ hydatidosis	Salmonellosis caused by *S*. Abortusovis
Contagious bovine pleuropneumonia	Rabies [Z]	*Escherichia coli* O157:H7 [Z]	Scrapie
Cysticercosis of bovine and porcine origin [Z]	Rift Valley fever [Z]	Foot-and-mouth disease	Sheep pox/goat pox
Echinococcosis/ hydatidosis	Rinderpest	Heartwater	Surra
Escherichia coli O157:H7 [Z]	Surra	Leptospirosis [Z]	Toxoplasmosis [Z]
Enzootic bovine leucosis	Tularaemia [Z]	Listeriosis [Z]	Tularaemia [Z]
Foot-and-mouth disease	Theileriosis	Maedi-visna	Transmissible spongiform encephalopathies
Haemorrhagic septicaemia	Transmissible spongiform encephalopathies	Melioidosis [Z]	Vesicular stomatitis [Z]
Hantavirus disease [Z]	Trichomonosis		
Heartwater	Trypanosomiasis [Z]		
	Vesicular stomatitis [Z]		

Swine	**Avian**
Anthrax [Z]	Avian infectious bronchitis
African swine fever	Avian infectious laryngotracheitis
Aujesky's disease	Avian mycoplasmosis (*M. gallisepticum and M. synoviae*)
Cysticercosis of bovine and porcine origin [Z]	Avian tuberculosis [Z]
Classical Swine fever	Duck virus enteritis (duck plague)
Ebola disease [Z]	Duck virus hepatitis
Echinococcosis/hydatidosis [Z]	Fowl cholera
Foot-and-mouth disease	Avian influenza (Fowl plague) [Z]
Japanese encephalitis [Z]	Fowl pox
Leptospirosis [Z]	Fowl typhoid (*Salmonella* Gallinarum)
Listeriosis [Z]	Infectious bursal disease (Gumboro disease)
Melioidosis [Z]	Japanese encephalitis [Z]
Menangle virus disease [Z]	Listeriosis [Z]
New world screwworm (*Cochliomyia hominivorax)* [Z]	Marek's disease
Old world screwworm (*Chrysomya bezziana*) [Z]	Melioidosis [Z]
Nipah virus disease [Z]	Murray Valley Encephalitis [Z]
Porcine brucellosis [Z]	Newcastle disease
Rabies [Z]	Psittacosis (ornithosis) [Z]
Rinderpest	Pullorum disease
Sendai virus infection	Salmonellosis caused by *Salmonella* Enteritidis [Z]
Swine erysipelas [Z]	Trichinellosis [Z]
Swine vesicular disease	
Toxoplasmosis [Z]	
Tularaemia [Z]	
Trichinellosis [Z]	
Vesicular stomatitis [Z]	

Cats and Dogs	**Equine**	
Anthrax [Z]	Anthrax [Z]	Hendra virus disease [Z]
Aujeszky's disease	African horse sickness	Horse mange
Leishmaniosis [Z]	Contagious equine metritis	Horse pox
Leptospirosis [Z]	Dermatophilosis	Japanese encephalitis [Z]
Listeriosis [Z]	Dourine	Leptospirosis [Z]
Lyme disease [Z]	Echinococcosis/ hydatidosis	Listeriosis [Z]
Melioidosis [Z]	Epizootic lymphangitis	Lyme disease [Z]
New world screwworm (*Cochliomyia hominivorax)* [Z]	Equine encephalosis	Melioidosis [Z]
Old world screwworm (*Chrysomya bezziana*) [Z]	Equine encephalomyelitis [Z]	New world screwworm (*Cochliomyia hominivorax)* [Z]
Hanta virus disease [Z]	Equine infectious anaemia	Old world screwworm (*Chrysomya bezziana*) [Z]
Rabies [Z]	Equine influenza	Rabies
Toxoplasmosis [Z]	Equine piroplasmosis	Strangles
Tularaemia [Z]	Equine rhinopneumonitis	Surra
	Equine viral arteritis	Tularaemia [Z]
	Getah virus disease	Ulcerative lymphangitis
	Glanders (Farcy) [Z]	
	Hantavirus disease [Z]	

Lagomorph	**Rodents**
Anthrax [Z]	Anthrax [Z]
Hantavirus disease [Z]	Aujeszky's disease
Listeriosis [Z]	Hantavirus disease [Z]
Melioidosis [Z]	Leptospirosis [Z]
Myxomatosis	Leishmaniosis [Z]
New world screwworm (*Cochliomyia hominivorax)* [Z]	Lymphocytic choriomeningitis [Z]
Old world screwworm (*Chrysomya bezziana*) [Z]	Listeriosis [Z]
Rabbit haemorrhagic disease	Melioidosis [Z]
Rabies [Z]	New world screwworm (*Cochliomyia hominivorax)* [Z]
Tularaemia [Z]	Old world screwworm (*Chrysomya bezziana*) [Z]
	Rabies [Z]
	Sendai virus infection
	Tularaemia [Z]

Fish	**Others**
Infection with *Aphenomyces invadens* (Epizootic ulcerative syndrome) Koi herpes virus Red sea bream irodoviral disease Spring viraemia of carp Listeriosis [Z] Melioidosis [Z]	Anthrax [Z] Ebola disease [Z] Hanta virus disease [Z] Japanese encephalitis [Z] Lymphocytic choriomeningitis [Z] Lyssa encephalitis [Z] Listeriosis [Z] Melioidosis [Z] Menangle virus disease [Z] New world screwworm (*Cochliomyia hominivorax)* [Z] Old world screwworm (*Chrysomya bezziana*) [Z] Nipah virus disease [Z] Rabies [Z] Sendai virus infection Simian B herpes virus [Z] Surra Tularaemia [Z] Yellow fever [Z]
Crustacean	
White spot disease	

Z: Zoonotic diseases which can infect both humans and animals

OVERVIEW OF REPORTING CRITERIA AND TIMEFRAMES FOR NOTIFIABLE DISEASES

Note that the purpose of the following tables is to guide veterinarians on the criteria for reporting notifiable disease. In some cases, clinical suspicion alone would warrant follow-up. In others, clinical suspicion should be accompanied with supporting laboratory diagnosis.

All laboratory confirmations must be reported to NParks/AVS.

Diseases of mammals and birds reportable within 24 hours		
Disease	**Clinical suspicion**	**Clinical suspicion and lab diagnosis**
African horse sickness	✓	
African swine fever	✓	
Anthrax	✓	
Avian influenza (Fowl plague)	✓	
Bovine spongiform encephalopathy	✓	
Bovine tuberculosis	✓	
Contagious bovine pleuropneumonia	✓	
Contagious equine metritis		✓
Dourine	✓	
Ebola disease	✓	
Equine encephalomyelitis	✓	
Equine infectious anaemia	✓	
Equine influenza		✓
Equine piroplasmosis		✓
Equine rhinopneumonitis	✓	
Equine viral arteritis		✓
Foot-and-mouth disease	✓	
Glanders (Farcy)	✓	
Hendra virus disease	✓	
Japanese encephalitis	✓	
Lyssa encephalitis	✓	
Marburg disease	✓	
Nipah virus disease	✓	
Peste des petits ruminants	✓	
Rabies	✓	
Rinderpest		✓
Salmonellosis caused by *Salmonella* Enteritidis		✓
Strangles	✓	
Classical Swine fever	✓	
Swine vesicular disease	✓	
Vesicular stomatitis	✓	
Yellow fever	✓	

Diseases of mammals and birds reportable within 72 hours		
Disease	**Clinical suspicion**	**Clinical suspicion and lab diagnosis**
Aujeszky's disease	✓	
Avian infectious bronchitis	✓	
Avian infectious laryngotracheitis	✓	
Avian mycoplasmosis (*M. gallisepticum* and *M. synoviae*)	✓	
Avian tuberculosis	✓	
Black quarter (blackleg)	✓	
Bluetongue	✓	
Bovine anaplasmosis		✓
Bovine babesiosis		✓
Bovine brucellosis	✓	
Bovine genital campylobacteriosis	✓	
Bovine malignant catarrhal fever (Bovine malignant catarrh)		✓
Caprine arthritis/encephalitis	✓	
Caprine/ovine brucellosis	✓	
Contagious agalactia		✓
Contagious caprine pleuropneumonia		✓
Cysticercosis of bovine and porcine origin	✓	
Dermatophilosis		✓
Duck virus hepatitis		✓
Duck Virus Enteritis (duck plaque)		✓
Echinococcosis/ hydatidosis	✓	
Enzootic bovine leucosis	✓	
Epizootic lymphangitis	✓	
Equine encephalosis	✓	
Escherichia coli O157:H7		✓
Fowl cholera		✓
Fowl pox	✓	
Fowl typhoid (*Salmonella* Gallinarum)		✓
Getah virus disease		✓
Haemorrhagic septicaemia		✓
Hantavirus disease		✓
Heartwater		✓
Horse mange		✓
Horse pox		✓

Diseases of mammals and birds reportable within 72 hours (continued)		
Disease	**Clinical suspicion**	**Clinical suspicion and lab diagnosis**
Infectious bovine rhinotracheitis		✓
Infectious bursal disease (Gumboro disease)		✓
Leishmaniosis		
Leptospirosis	✓	
Listeriosis		✓
Lumpy skin disease	✓	
Lyme disease		✓
Lymphocytic choriomeningitis		✓
Maedi-visna		✓
Marek's disease	✓	
Melioidosis		✓
Menangle virus disease		✓
Murray Valley encephalitis		✓
Myxomatosis		✓
Nairobi sheep disease		✓
New World screwworm (*Cochliomyia hominivora)*		✓
Newcastle disease	✓	
Old World screwworm (*Chrysomya bezziana*)		✓
Ovine pulmonary adenocarcinoma (Ovine pulmonary adenomatosis)	✓	
Paratuberculosis		✓
Porcine brucellosis		✓
Psittacosis (ornithosis)		✓
Pullorum disease		✓
Q fever		✓
Rabbit haemorrhagic disease		✓
Rift Valley fever		✓
Salmonellosis caused by *S. Abortusovis*		✓
Scrapie	✓	
Sendai virus infection		✓
Sheep pox/goat pox	✓	
Simian B Herpes Virus		✓
Surra		✓
Swine erysipelas	✓	
Theileriosis		✓
Toxoplasmosis		✓

Diseases of mammals and birds reportable within 72 hours (continued)		
Disease	**Clinical suspicion**	**Clinical suspicion and lab diagnosis**
Transmissible spongiform encephalopathies		✓
Trichinellosis		✓
Trichomonosis		✓
Trypanosomiasis		✓
Tularaemia		✓
Ulcerative lymphangitis	✓	

Disease of aquatic animals and amphibians reportable within 24 hours		
Disease	**Clinical suspicion**	**Clinical suspicion and lab diagnosis**
White spot disease	✓	

Disease of aquatic animals and amphibians reportable within 72 hours		
Disease	**Clinical suspicion**	**Clinical suspicion and lab diagnosis**
Infection with *Aphenomyces invadens* (Epizootic ulcerative syndrome)	✓	
Koi herpes virus	✓	
Red Sea Bream Iridoviral disease	✓	
Spring Viraemia of carp		✓

Schedule of Notifiable Diseases

Part A1: Diseases of mammals and birds (Notify within 24 hours)	
Disease	**Description**
1. African horse sickness	• **Pathogen**: African horse sickness virus • **Susceptible species***:* Equids: horses, mules, donkeys and zebra • **Route of transmission**: Biological vectors such as midges (*Culicoides* spp.) and mosquitoes • **Risk factor**s: Import of live horses from a country of origin/residence with a history of the disease and/or with a history of an outbreak of the disease. • **Incubation perio**d: 7 to 14 days • **Location**: Sub-Saharan Africa **<u>Clinical features</u>**: • Fever • Respiratory signs: dyspnoea, coughing and frothing from nostrils • Cardiac signs: Swelling of supraorbital fossa, eyelids, facial tissues, neck, thorax, brisket and shoulders, death within 1 week • Mortality >50% **<u>Criteria for reporting</u>**: Clinical suspicion AND/OR any positive laboratory test result using the following methods: • Detection of agent: PCR, virus isolation • Detection of immune response: ELISA, CFT, immunoblotting **References**: OIE. (2017). *Manual for Diagnostic Tests for Terrestrial Animals (the Terrestrial Manual*). World Organisation for Animal Health. Online Access <http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.05.01_AHS.pdf>

2. African swine fever	• **Pathogen:** African swine fever virus
	• **Susceptible Species:** Swine, including wild and domestic pigs.
	• **Route of transmission:** Direct contact with the excretions and secretions of infected animal. Indirect transmission via ingestion of uncooked meat from infected animals, contact with fomites and though ticks
	• **Risk factors:**
	  ○ Import of infected pigs and meat/meat products from a country of origin/residence with a history of the disease and/or with a history of an outbreak of the disease.
	  ○ Exposure of pigs to infected animals and meat from infected animals
	• **Incubation period:** 3 to 15 days
	• **Location:** Sub-Saharan Africa and Europe
	
	<u>Clinical features</u>:
	• Fever, weight loss, anorexia, vomiting and diarrhoea
	• Reddening of the skin, in particular the tips of the ears and nose

	• Respiratory distress, excess pleural, pericardial and/or peritoneal fluid. • Abortion, still birth and weak litters • Sudden death **Criteria for reporting**: Clinical suspicion AND/OR any positive laboratory test result using the following methods: • Detection of agent: cell culture inoculation, antigen detection FAT, PCR • Detection of immune response: ELISA, IFA, immunoblotting **References**: OIE. (2013). *Technical Disease Card*. Online Access <https://www.oie.int/fileadmin/Home/eng/Animal_Health_in_the_World/docs/pdf/Disease_cards/AFRICAN_SWINE_FEVER.pdf> Spickler, Anna Rovid. (2015). *African Swine Fever*. Online Access <http://www.cfsph.iastate.edu/DiseaseInfo/clinical-signs-photos.php?name=african-swine-fever> OIE. (2017*). Terrestrial Animal Health Code, (the Terrestrial Code*). World Organisation for Animal Health. Online Access http://www.oie.int/index.php?id=169&L=0&htmfile=chapitre_asf.htm
3. Anthrax	• **Pathogen**: *Bacillus anthracis* • **Susceptible Species**: [Zoonotic] Anthrax affects a large range of domestic and wild animals, including cattle, buffalo, goats, sheep, camelid, equid, swine, dogs and cats. • **Route of transmission:** Ingestion and inhalation anthrax spores found in soil, feed, hair and skin of infected animals, or contact through cutaneous lesions. • **Risk factors:** Import of infected animals from a country of origin/residence with a history of the disease and/or with a history of an outbreak of the disease. • **Incubation period:** 20 days. • **Location:** Anthrax can be found worldwide but it is particularly common in Africa, Asia and the Middle East. **Clinical features**: • Unexplained, sudden death in susceptible animals where there are bloodstained discharges from body openings ○ **Suspect cases should remain undisturbed and unopened where found until anthrax has been ruled out** • Fever, harsh dry cough, blood in nostrils, seizures and anorexia **Criteria for reporting**: Clinical suspicion AND/OR any positive laboratory test result using the following methods: • Detection of agent: culture, Mc'Fadyean staining, PCR **References**:

	OIE. (2013). *Technical Disease Card*. Online Access <http://www.oie.int/fileadmin/Home/eng/Media_Center/docs/pdf/Disease_cards/ANTHRAX-EN.pdf>. AFRIVIP, *Diagnosis and differential diagnosis*. Online Access <http://www.afrivip.org/sites/default/files/Anthrax/diagnosis.html>. www.msdvetmanual.com/generalised-conditions/anthrax/overview-of-anthrax>. OIE. (2017). *Terrestrial Animal Health Code, (the Terrestrial Code). World Organisation for Animal Health*. Online Access <http://www.oie.int/index.php?id=169&L=0&htmfile=chapitre_anthrax.htm> OIE. (2017). *Manual for Diagnostic Tests for Terrestrial Animals (the Terrestrial Manual).* World Organisation for Animal Health. Online Access <www.oie.int/index.php?id=169&L=0&htmfile=chapitre_anthrax.htm>
4. Avian influenza (Fowl plague)	• **Pathogen**: Type A influenza virus • **Susceptible species:** [Zoonotic potential] Birds. • **Route of transmission:** Direct contact with infected birds, contact with secretions and excretions from infected birds and contaminated fomites. • **Risk factors:** Exposure to wild infected birds, poor biosecurity, import of infected birds from a country of origin/residence with a history of the disease and/or with a history of an outbreak of the disease. • **Incubation period**: 21 days • **Location**: Asia, Middle East and Eurasia. **Clinical features:** Strains of AI virus are classified into two categories: • Highly Pathogenic Avian Influenza: Sudden drop in egg production and quality, increased mortality rates, swollen and cyanotic wattles and combs, respiratory distress, ocular and nasal discharge and diarrhoea ○ Ducks and geese may show minimal clinical signs • Low Pathogenicity Avian Influenza: Mild to no clinical signs. **Criteria for reporting**: Clinical suspicion AND/OR any positive laboratory test (any haemagglutinin and neuraminidase types) result using the following methods: • Detection of agent: PCR, virus isolation, direct RNA detection • Detection of immune response: AGID, ELISA, haemagglutination inhibition tests **References**: OIE. (2017*). Terrestrial Animal Health Code, (the Terrestrial Code*). World Organisation for Animal Health. Online Access < http://www.oie.int/index.php?id=169&L=0&htmfile=chapitre_avian_influenza_viruses.htm> OIE. (2017). *Manual for Diagnostic Tests for Terrestrial Animals (the Terrestrial Manual*). World Organisation for Animal Health. Online Access < http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.03.04_AI.pdf >

	OIE. (2014). *Technical Disease Card*. Online Access <http://www.oie.int/fileadmin/Home/eng/Animal_Health_in_the_World/docs/pdf/Disease_cards/HPAI.pdf> Texas A&M University. (2006). Avian Influenza. Online Access <www.cvm.tamu.edu/FADR/Files/AvianInfluenzaSymptoms.ppt> Texas A&M University. (2006). Avian Influenza. Online Access <http://www.cvm.tamu.edu/fadr/disease.aspx?DID=2600>
5. Bovine spongiform encephalopathy	• **Pathogen**: Prions, a member of the transmissible spongiform encephalopathies (TSEs) • **Susceptible species**: [Zoonotic] Mainly occurs in cattle, but the host range is broad and includes exotic ruminants and various felids. • **Route of transmission:** Ingestion of prion-containing tissues. • **Risk factors:** Feeding of meat-bone-meal contaminated with BSE agent • **Incubation period**: 2 to 8 years • **Location**: Europe **Clinical features:** • Change in behaviour and mental status (i.e. apprehension, hyperaesthesia, aggression) • Gait abnormalities (i.e. hindlimb ataxia) • Deterioration over several weeks/months to recumbency, coma and death **Criteria for reporting**: Clinical suspicion AND/OR any positive laboratory test result using the following methods: • Detection of agent: IHC, ELISA, histopathology **References**: OIE. (2017). *Manual for Diagnostic Tests for Terrestrial Animals (the Terrestrial Manual*). World Organisation for Animal Health. Online Access <http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.04.05_BSE.pdf> OIE. (2013). *Technical Disease Card*. Online Access <http://www.oie.int/doc/ged/D13944.PDF>. FAO. *B115 Bovine Spongiform Encephalopathy*. Online Access <http://lrd.spc.int/ext/Disease_Manual_Final/b115__bovine_spongiform_encephalopathy.html>.
6. Bovine tuberculosis	• **Pathogen**: *Mycobacterium bovis* • **Susceptible species**: [Zoonotic] Cattle, sheep, goats, camelids and buffaloes • **Route of transmission:** Inhalation of infective droplets from infected animals, ingestion of raw milk from infected cows and through contaminated environment such as pasture and feed

	• **Risk factors:** Introduction of infected animals that are subclinically infected • **Incubation period:** Weeks to years (chronic) **Clinical features**: • Weakness, weight loss, loss of appetite, fluctuating fever, intermittent hacking cough, large prominent lymph nodes and chronic mastitis • Post-mortem findings: ○ Miliary nodules, granulomas or tubercles (nonvascular nodular granulomas) in lungs and lymph nodes (usually lungs, retropharyngeal, bronchial and mediastinal) **Criteria for reporting**: Clinical suspicion AND/OR any positive laboratory test result using the following methods: • Detection of agent: PCR, culture • Detection of immune response: tuberculin, ELISA **References**: OIE. (2017*). Terrestrial Animal Health Code, (the Terrestrial Code*). World Organisation for Animal Health. Online Access < http://www.oie.int/index.php?id=169&L=0&htmfile=chapitre_bovine_tuberculosis.htm> OIE. (2017). *Manual for Diagnostic Tests for Terrestrial Animals (the Terrestrial Manual*). World Organisation for Animal Health. Online Access < http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.04.06_BOVINE_TB.pdf> Department for Environment Food & Rural Affairs. (2013). *Bovine Tuberculosis Evidence Plan*. Online Access. <https://assets.publichsing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/221077/pb13909-evidenceplan-bovine-tuberculosis.pdf> The Cattle Site. (2014). *TB (Bovine Tuberculosis*). Online Access.<http://www.thecattlesite.com/diseaseinfo/185/tb-bovine-tuberculosis/> The Center for Food Security & Public Health. (2009). Bovine Tuberculosis. Iowa State University. Online Access. <http://www.cfsph.iastate.edu/Factsheets/pdfs/bovine_tuberculosis.pdf>
7. Contagious bovine pleuropneumonia	• **Pathogen**: *Mycoplasmamycoides* subspecies *mycoides* • **Susceptible species**: Ruminants of the *Bos* and *Bubalus* genuses, i.e. cattle, water buffaloes and yak. • **Route of transmission:** Either through aerosolised droplets or direct contact with an infected animal. Transplacental infection can occur. • **Risk factors:** Import of infected animals from a country of origin/residence with a history of the disease and/or with a history of an outbreak of the disease. • **Incubation period:** 6 months. • **Location:** Africa and the Middle East **Clinical features:**

	• Fever, anorexia, depression • Respiratory signs: coughing, nasal discharge, dyspnoea and tachypnoea • Post-mortem findings: ○ Unilateral pneumonia associated with pleurisy. **<u>Criteria for reporting</u>**: Clinical suspicion AND/OR any positive laboratory test result using the following methods: • Detection of agent: PCR, culture • Detection of immune response: ELISA **References**: OIE. (2017). *Manual for Diagnostic Tests for Terrestrial Animals (the Terrestrial Manual*). World Organisation for Animal Health. Online Access <http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.04.08_CBPP.pdf> OIE. (2018). *General Disease Information Sheets*. Online Access <http://www.oie.int/doc/ged/D13980.PDF>. Merck Sharp & Dohme Corp. (2016). *Contagious Bovine Pleuropneumonia. MSD Manual (Veterinary Manual).* Merck & Co. Online Access <http://www.msdvetmanual.com/respiratory-system/respiratory-diseases-of-cattle/contagious-bovine-pleuropneumonia>.
8. Contagious equine metritis	• **Pathogen**: *Taylorella equigenitalis* • **Susceptible species:** Equids • **Route of transmission**: Venereal transmission through mating, artificial insemination and fomites • **Risk factors**: Import of infected animals from a country of origin/residence with a history of the disease and/or with a history of an outbreak of the disease. • **Incubation period**: 2 to 14 days • **Location**: Europe **<u>Clinical features</u>**: • In mares: signs of metritis: copious, mucopurulent vaginal discharge, infertility. • Stallions do not show clinical signs of disease. **<u>Criteria for reporting</u>**: Any positive laboratory test result using the following methods: • Detection of agent: PCR, culture **References**: OIE. (2017). *Manual for Diagnostic Tests for Terrestrial Animals (the Terrestrial Manual*). World Organisation for Animal Health. Online Access <http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.05.02_CEM.pdf> Merck Sharp & Dohme Corp. (2016). *Contagious Equine Metritis. MSD Manual (Veterinary Manual).* Merck & Co. Online Access

	<http://www.msdvetmanual.com/reproductive-system/metritis-in-large-animals/contagious-equine-metritis>.
9. Dourine	• **Pathogen**: *Trypanosoma equiperdum* • **Susceptible species**: Horses, mules and donkeys • **Route of transmission**: Venereal transmission, in which *T. equiperdum* may be found in the vaginal secretions of infected mares and seminal fluid of the stallion. • **Risk factors**: import of infected animals from a country of origin/residence with a history of the disease and/or with a history of an outbreak of the disease. • **Location:** Africa, Asia and South America. • **Incubation period**: 6 months. **Clinical features**: • Fever, oedema at the genitals and udders, oedematous urticarial skin lesions • In mares: mucopurulent vaginal discharge, vulvitis and vaginitis • In stallions: thickened sheath and scrotum **Criteria for reporting**: Clinical suspicion AND/OR any positive laboratory test result using the following method: • Detection of immune response: Complement fixation test (CFT). **References**: OIE. (2017*). Terrestrial Animal Health Code, (the Terrestrial Code*). World Organisation for Animal Health. Online Access <http://www.oie.int/index.php?id=169&L=0&htmfile=chapitre_dourine.htm> OIE. (2017). *Manual for Diagnostic Tests for Terrestrial Animals (the Terrestrial Manual*). World Organisation for Animal Health. Online Access <http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.05.03_DOURINE.pdf> The Center for Food Security & Public Health. (2015). *Dourine*. Iowa State University. Online Access. <http://www.cfsph.iastate.edu/Factsheets/pdfs/dourine.pdf>. Montana Department of Livestock. Dourine Signs and Symptoms. Online Access <http://liv.mt.gov/ah/diseases/Dourine/signs-and-symptoms>.
10. Ebola disease	• **Pathogen**: Ebolavirus • **Susceptible species**: [Zoonotic] Bats, primates and pigs. • **Route of transmission:** Direct contact with body fluids (blood, saliva, urine, vomitus, faeces, secretions, semen) and/or organs of an infected animal. • **Risk factors:** Import of infected animals from a country of origin/residence with a history of the disease and/or with a history of an outbreak of the disease, contact with infected animal or human. • **Incubation period**: 3 to 16 days in primates and pigs • **Location**: Central and West Africa

	Clinical features: • Fever, anorexia, vomiting, diarrhoea, dyspnoea, weight loss and skin rash • Bleeding from mucous membranes **Criteria for reporting:** Clinical suspicion AND/OR any positive laboratory test result using the following methods: • Detection of viral RNA with RT-PCR • Detection of viral antigen with ELISA or immunostaining **References**: The Center for Food Security & Public Health. (2016). *Ebolavirus and Marburgvirus Infections*. Iowa State University. Online Access. <http://www.cfsph.iastate.edu/Factsheets/pdfs/viral_hemorrhagic_fever_filovirus.pdf>. Bradford, A. (2016). Ebola: Causes, Symptoms & Treatment. Online Access <http://www.livescience.com/48311-ebola-causes-symptoms-treatment.html>.
11. Equine encephalomyelitis	• **Pathogen**: Eastern, Western and Venezuelan equine encephalomyelitis viruses (EEEV, WEEV, VEEV) • **Susceptible species**: [Zoonotic] Equids and humans, birds (EEE, WEE) and other mammals such as rodents (EEE, VEE). • **Route of transmission**: By mosquito vectors • **Risk factors**: import of infected animals from a country of origin/residence with a history of the disease and/or with a history of an outbreak of the disease. • **Incubation period**: 5 to 14 days (for EEE and WEE), 5 days (for VEE) • **Location**: North America **Clinical features**; • Neurological signs: hyperexcitability, blindness, ataxia, behavioural changes, paresis, paralysis, convulsions, • Other clinical signs include: fever, anorexia, depression, diarrhoea, weight loss • Death **Criteria for reporting**: Clinical suspicion AND/OR any positive laboratory test result AND/OR rising antibody titre detected using the following methods: • Detection of agent: PCR, virus isolation, CFT, plaque reduction neutralisation (PRN), immunofluorescence • Detection of immune response: plaque reduction neutralisation (PRN), ELISA, CFT **References**: OIE. (2017*). Terrestrial Animal Health Code, (the Terrestrial Code*). World Organisation for Animal Health. Online Access <http://www.oie.int/index.php?id=169&L=0&htmfile=chapitre_vee.htm>

	OIE. (2017). *Manual for Diagnostic Tests for Terrestrial Animals (the Terrestrial Manual*). World Organisation for Animal Health. Online Access <http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.05.05_EQUINE_ENCEPH.pdf> The Center for Food Security & Public Health. (2015). *Equine Encephalomyelitis*. Iowa State University. Online Access <http://www.cfsph.iastate.edu/Factsheets/pdfs/easter_wester_venezuelan_equine_encephalomyelitis.pdf>.
12. Equine infectious anaemia	• **Pathogen**: equine infectious anemia virus (EIAV), • **Susceptible species**: Equids. • **Route of transmission**: mechanical transmission through biting insects such as horse flies, milk and semen of infected animals, vertical transmission in utero and iatrogenic transmission via the transfer of blood from an infected horse through contaminated needles • **Risk factors**: import of infected animals from a country of origin/residence with a history of the disease and/or with a history of an outbreak of the disease. • **Incubation period**: 7 to 45 days **Clinical features:** • Pyrexia, weight loss, inappetance and depression • Petechiae, epistaxis, blood-stained faeces, anaemia, thrombocytopenia, ventral oedema and jaundice • Tachypnoea • Tachycardia **Criteria for reporting:** Clinical suspicion AND any positive detection of the agent OR rising antibody titre detected using the following methods: • Detection of agent: virus isolation, PCR, immunofluorescence • Detection of immune response: AGID, ELISA **References**: OIE. (2017). *Manual for Diagnostic Tests for Terrestrial Animals (the Terrestrial Manual*). World Organisation for Animal Health. Online Access <http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.05.06_EIA.pdf> The Center for Food Security & Public Health. (2009). *Equine Infectious Anemia*. Iowa State University. Online Access. <http://www.cfsph.iastate.edu/Factsheets/pdfs/equine_infectious_anemia.pdf>. Merck Sharp & Dohme Corp. (2016). *Overview of Equine Infectious Anemia. MSD Manual (Veterinary Manual).* Merck & Co. Online Access <http://www.msdvetmanual.com/generalized-conditions/equine-infectious-anemia/overview-of-equine-infectious-anemia>

13. Equine influenza	• **Pathogen**: Type A influenza virus (H7N7 and H3N8 subtypes) • **Susceptible species**: Horses and other equidae (e.g. donkeys, mules and zebras), dogs (H3N8). • **Route of transmission**: Respiratory route, and indirectly by contaminated personnel, vehicles and fomites • **Risk factors**: import of infected animals from a country of origin/residence with a history of the disease and/or with a history of an outbreak of the disease. • **Incubation period**: less than 24 hours but may be extended in partially immune vaccinated animals. • **Location:** Found worldwide including North America (Florida lineage clade 1) and the Eastern Hemisphere (Florida lineage clade 2) **Clinical features:** • Pyrexia • Deep dry, often paroxysmal cough • Serous to mucopurulent nasal discharge **Criteria for reporting:** Any positive detection of the agent AND rising antibody titre detected using the following methods: • Detection of agent: PCR, ELISA, virus isolation • Detection of immune response: SRH, Haemagglutination-inhibition **References**: OIE. (2017). *Manual for Diagnostic Tests for Terrestrial Animals (the Terrestrial Manual*). World Organisation for Animal Health. Online Access <http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.05.07_EQ_INF.pdf> The Center for Food Security & Public Health. (2016). *Influenza*. Iowa State University. Online Access <http://www.cfsph.iastate.edu/Factsheets/pdfs/influenza.pdf> petMD. (2018). Flu Virus in Horses. Online Access <http://www.petmd.com/horse/conditions/respiratory/c_hr_equine_influenza>
14. Equine piroplasmosis	• **Pathogen**: B*abesia caballi* or *Theileria equi* (formerly *Babesia equi*) • **Susceptible species**: Horses, mules, donkeys and zebra • **Route of transmission**: By Ixodid ticks, vertical transmission (in utero) and through mechanical vectors contaminated by infected blood. Ticks become infected upon ingesting parasites in the blood of infected equids. Infected animals may remain carriers for long periods and act as sources of infection for tick vectors. • **Risk factors**: import of infected animals from a country of origin/residence with a history of the disease and/or with a history of an outbreak of the disease. • **Incubation period:** 12 to 19 days (for *T. equi*), and 10 to 30 days (for *B. caballi*).

	• **Location**: Endemic in many tropical and subtropical regions (including parts of Africa, Middle East, Asia, Central and South America, the Caribbean and Europe). **Clinical features:** • Fever, inappetance, tachypnoea and tachycardia • Petechial haemorrhages and/or ecchymoses on mucous membranes • Anaemia, jaundice, thrombocytopenia, haemoglobinuria • Post-mortem findings: enlarged liver and spleen, pale to dark red kidneys (in the case of hemoglobinuria) **Criteria for reporting:** Clinical suspicion AND any positive laboratory test result using the following methods: • Detection of agent: microscopic examination (stained), PCR • Detection of immune response: IFAT, C-ELISA, CFT **References**: OIE. (2017). *Manual for Diagnostic Tests for Terrestrial Animals (the Terrestrial Manual*). World Organisation for Animal Health. Online Access <http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.05.08_EQUINE_PIROPLASMOSIS.pdf> The Center for Food Security & Public Health. (2008). *Equine Piroplasmosis*. Iowa State University. Online Access <http://www.cfsph.iastate.edu/Factsheets/pdfs/equine_piroplasmosis.pdf>
15. Equine rhinopneumonitis	• **Pathogen**: Equid herpesvirus-1 • **Susceptible species**: Equids • **Route of transmission**: inhaling infected droplets or ingesting material contaminated by nasal discharges or through exposure to aborted disease-carrying fetuses. • **Risk factors**: import of infected animals from a country of origin/residence with a history of the disease and/or with a history of an outbreak of the disease. • **Incubation period**: 1 to 10 days **Clinical features:** • Upper respiratory tract disease, fever, inappetance, depression and nasal discharge • Abortion, perinatal foal death, or paralytic neurological disease (equine herpesvirus myeloencephalopathy). **Criteria for reporting:** Clinical suspicion AND/OR any positive detection of the agent AND/OR rising antibody titre detected using: • Detection of agent: PCR, virus isolation, immunofluorescence • Detection of immune response: VN, CFT **References**: APHIS. (2016). U.S. *National List of Reportable Animal Diseases (NLRAD) - National Animal Health Reporting System (NAHRS) Operational Manual.* Online Access

	<https://www.aphis.usda.gov/animal_health_nahrs/downloads/nahrsoperationalmanual.pdf> OIE. (2017). *Manual for Diagnostic Tests for Terrestrial Animals (the Terrestrial Manual*). World Organisation for Animal Health. Online Access <https://web.oie.int/eng/normes/MMANUAL/2008/pdf/2.05.09_EQUINE_RHINO.pdf>. DePaolo Equine Concepts. (2012) Introduction to Equine Rhino. Online Access <https://depaoloequineconcepts.wordpress.com/2012/03/23/introduction-to-equine-rhino/>.
16. Equine viral arteritis	• **Pathogen**: equine arteritis virus • **Susceptible Species**: Equids • **Route of transmission**: Venereal transmission, including artifical insemination, the respiratory route and contact with aborted foetuses. • **Risk factors**: import of infected animals from a country of origin/residence with a history of the disease and/or with a history of an outbreak of the disease. • **Incubation period**: 2 days to 2 weeks • **Location**: Europe, North and South America, Asia, Afria and Australia. **Clinical features:** • Conjunctivitis, rhinitis • Oedema of the limbs, mammary glands or scrotum • Abortion • Pyrexia, depression, anorexia **Criteria for reporting:** Positive detection of the agent AND/OR rising antibody titre detected using the following methods: • Detection of agent: PCR, virus isolation • Detection of immune response: ELISA, VN, CFT **References**: APHIS. (2016). U.S. *National List of Reportable Animal Diseases (NLRAD) - National Animal Health Reporting System (NAHRS) Operational Manual.* Online Access <https://www.aphis.usda.gov/animal_health_nahrs/downloads/nahrsoperationalmanual.pdf> The Center for Food Security & Public Health. (2009). *Equine Viral Arteritis*. Iowa State University. Online Access. <http://www.cfsph.iastate.edu/Factsheets/pdfs/equine_viral_arteritis.pdf>. Merck Sharp & Dohme Corp. (2016). *Overview of Equine Viral Arteritis. Merck Manual (Veterinary Manual).* Merck & Co. Online Access <http://www.merckvetmanual.com/generalized-conditions/equine-viral-arteritis/overview-of-equine-viral-arteritis>. OIE. (2017). *Manual for Diagnostic Tests for Terrestrial Animals (the Terrestrial Manual*). World Organisation for Animal Health. Online Access <www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.05.10_EVA.pdf>.

17. Foot-and-mouth disease	• **Pathogen**: Foot and mouth disease virus (FMDV) • **Susceptible species**: Cloven-hooved mammals such as cattle, pigs, sheep, deer, goats and buffalo • **Route of transmission:** Inhalation of infectious aerosols, direct contact with abraded skin or mucous membranes of infected animals, fomites and ingestion of contaminated meat or milk • **Risk factors:** Infected animals, their secretions, excretions, or fomites, or products contaminated with FMDV. • **Incubation period:** 14 days. • **Location:** Endemic in parts of Asia, Africa, the Middle East and South America. **Clinical features**: • In cattle: pyrexia, vesicles and erosions in the mouth, tongue, feet and teats and a significant drop in milk production for dairy breeds • In sheep and goats: pyrexia, vesicles and erosions along the coronary band or interdigital spaces, profuse salivation, agalactia, lameness, abortion, still birth and weak offspring. Sheep may also be inapperent carriers. • In pigs: pyrexia, lameness and vesicles on the tongue, nose and hoof **Criteria for reporting**: Clinical suspicion AND/OR any positive laboratory test result using the following methods: • Detection of agent: PCR, virus isolation, ELISA • Detection of immune response: VN, CFT, AGID, NSP antibody test **References**: OIE. (2017*). Terrestrial Animal Health Code, (the Terrestrial Code*). World Organisation for Animal Health. Online Access < <http://www.oie.int/index.php?id=169&L=0&htmfile=chapitre_fmd.htm> OIE. (2017). *Manual for Diagnostic Tests for Terrestrial Animals (the Terrestrial Manual*). World Organisation for Animal Health. Online Access < http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.01.08_FMD.pdf> OIE. (2013). *Technical Disease Card*. Online Access <www.oie.int/fileadmin/Home/eng/Animal_Health_in_the_World/dpcs/pdf/Disease_cards/FOOT_AND_MOUTH_DISEASE.pdf> Western College of Veterinary Medicine. (2010). *Foot and Mouth Disease*. Online Access <http://footandmouthdisease.yolasite.com/clinical-signs.php>.
18. Glanders (Farcy)	• **Pathogen**: *Burkholderia mallei* • **Susceptible species**: [Zoonotic] Primarily affects horses, mules and donkeys. • **Route of transmission**: Contact with contaminated soil or water through skin wounds; ingestion of contaminated food or water; inhalation of soil dust

	• **Risk factors**: Predisposing medical conditions such as chronic renal disease, chronic lung disease and immunosuppression • **Incubation period**: 6 months. • **Location:** The Middle East, Asia, Africa and Central and South America. **Clinical features**: • Mucopurulent nasal discharge • Pyrexia, coughing and dyspnoea • Nodules on the skin of the legs or body or in internal organs such as the lungs • Enlarged lymph nodes around the neck **Criteria for reporting**: Clinical suspicion AND/OR any positive laboratory test result using the following methods: • Detection of the agent: PCR, Culture • Detection of immune response: CFT, ELISA **References**: OIE. (2017*). Terrestrial Animal Health Code, (the Terrestrial Code*). World Organisation for Animal Health. Online Access <http://www.oie.int/index.php?id=169&L=0&htmfile=chapitre_glanders.htm> OIE. (2018). *General Disease Information Sheets*. Online Access <http://www.oie.int/doc/ged/D13968.PDF>. Malik, P., Singha, H., Goyal, S.K., Khurana, S., Tripathi, B.N., Dutt, A., Singh, D., Sharma, N. and Jain, S. (2015), Incidence of Burkholderia mallei infection among indigenous equines in India, Veterinary record open 2: e000129. Doi:10.1136/vetreco-2015-000129. Online Access <http://vetrecordopen.bmj.com/content/2/2/e000129>. OIE. (2017). *Manual for Diagnostic Tests for Terrestrial Animals (the Terrestrial Manual*). World Organisation for Animal Health. Online Access <www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.05.11_GLANDERS.pdf>.
19. Hendra virus disease	• **Pathogen**: Hendra virus (HeV) • **Susceptible Species:** [Zoonotic] Horses • **Route of transmission**: Virus is found in bats of the genus Pteropus (pteropid fruit bats/ flying foxes) in urine, blood, saliva and faeces.Horses ingest or inhale the virus from the environment in areas contaminated by the bats urine, fruits and spats. • **Risk factors**: Import of live horses from a country of origin/residence with a history of the disease and/or with a history of an outbreak of the disease. • **Incubation period**: 5 to 16 days • **Location**: Australia **Clinical features:** • Jaundice, oedema

	• Respiratory signs: dyspnoea and frothy/bloodstained nasal discharge • Neurological signs: ataxia, altered consciousness, blindness, head tilt, circling, muscle twitches or tremors, paralysis **<u>Criteria for reporting:</u>** Clinical suspicion AND/OR any positive detection of the agent AND/OR rising antibody titre detected using the following methods: • Detection of agent: PCR, virus isolation, IHC • Detection of immune response: VN, ELISA **References**: The Center for Food Security & Public Health. (2015). *Hendra Virus infection*. Iowa State University. Online Access. <http://www.cfsph.iastate.edu/Factsheets/pdfs/hendra.pdf>. Pets Australia Pty Ltd. (2013) Hendra Virus Update – in Humans, Cats, Bats, Dogs & Horses. Online Access <https://petsaustralia.org/uncategorized/hendra-virus-update-in-humans-cats-bats-dogs-horses/>. OIE. (2017). *Manual for Diagnostic Tests for Terrestrial Animals (the Terrestrial Manual*). World Organisation for Animal Health. Online Access <http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.01.14_NIPAH_HENDRA.pdf>
20. Japanese encephalitis (Japanese B Encephalitis)	• **Pathogen**: Japanese encephalitis virus, an arbovirus in the genus *Flavivirus* and family Flaviviridae. • **Susceptible Species**: [Zoonotic] Equids, pigs, birds, cattle, sheep, goats, dogs, cats, chickens, ducks, wild animals, reptiles and amphibians • **Route of transmission**: mosquito vector, in the genus *Culex* • **Incubation period**: 21 days • **Location**: Asia **<u>Clinical features</u>**: • In horses: pyrexia, inappetance, muscle tremors, incoordination, bruxism, difficulty in swallowing impaired locomotion, loss of vision, collapse, paresis, paralysis, stupor, coma and death • In pigs: stillbirth, mummified, weak piglets born with neurologic signs **<u>Criteria for reporting</u>**: Clinical suspicion AND/OR positive detection of the agent AND/OR rising antibody titre detected using the following methods: • Detection of agent: PCR, virus isolation • Detection of immune response: CFT, ELISA **References**: OIE. (2017*). Terrestrial Animal Health Code, (the Terrestrial Code*). World Organisation for Animal Health. Online Access <

	http://www.oie.int/index.php?id=169&L=0&htmfile=chapitre_japanese_encephalitis.htm> OIE. (2017). *Manual for Diagnostic Tests for Terrestrial Animals (the Terrestrial Manual*). World Organisation for Animal Health. Online Access < http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.01.10_JEV.pdf> OIE. (2013). *Technical Disease Card*. Online Access <http://www.oie.int/fileadmin/Home/eng/Animal_Health_in_the_World/docs/pdf/Disease_cards/JAPANESE_ENCEPHALITIS.pdf>.
21. Lyssa encephalitis	• **Pathoge**n: Lyssavirus Genotype 7 • **Susceptible species:** Bat species i.e. fruit bats, flying foxes • **Route of Transmission:** Saliva; through bites and scratches • **Incubation period:** Weeks to months **Clinical features:** • Paralysis, delirium, convulsions and death • Presented with bites and scratches **Criteria for reporting:** Clinical suspicion AND/OR any positive laboratory test result using the following methods: • Detection of agent: virus isolation, FAT **References**: McColl, K.A., Tordo, N. and Setien, A.A. (2000). Bat lyssavirus infections, Rev. sci. tech. Off. Int. Epiz. 19(1), 177-196. Online Access <http://www.oie.int/doc/ged/D9297.PDF>
22. Marburg disease	• **Pathogen**: Marburgvirus • **Susceptible species**: [Zoonotic] humans and non-human primates. Bats are thought to be the reservoir hosts. • **Route of transmission**: Blood, secretions and excretions, and tissues from animals may contain infectious virus and fomites contaminated by blood. Infected bat faeces or aerosols are the most likely routes of infection. Exposure to blood and other bodily secretions • **Incubation period**: 3 – 5 days in nonhuman primates, but may be as long as 16 days. • **Location**: Africa **Clinical features:** • Petechiae, bleeding into the gastrointestinal tract, from wounds and mucous membranes, shock, dyspnoea • Vomiting and diarrhoea • Sudden death **Criteria for reporting:** Clinical suspicion AND any positive laboratory test result using the following methods: • Detection of agent: ELISA, PCR, virus isolation

	• Detection of immune response: ELISA, IFA **References**: The Center for Food Security & Public Health. (2016). *Ebolavirus and Marburgvirus Infections*. Iowa State University. Online Access. <http://www.cfsph.iastate.edu/Factsheets/pdfs/viral_hemorrhagic_fever_filovirus.pdf> WHO. (2018). Marburg virus disease. Online Access <http://www.who.int/csr/disease/marburg/factsheet/en/>
23. Nipah virus disease	• **Pathogen**: Nipah virus • **Susceptible species**: [Zoonotic] Nipah virus affects a large range of mammals, including humans • **Route of transmission**: Pteropus bats transmit this virus to animals by ingestion of contaminated fruit, water, or aborted bat fetuses • **Incubation period**: 7 to 14 days • **Risk factors:** Contact with infected live pigs (exposure to respiratory secretions, urine and faeces from pigs) • **Location**: Southeast Asia **Clinical features**: • Respiratory signs: dyspnoea, tachypnoea, open mouth breathing/panting, cough, froth and/or clear to haemorrhagic exudate from mouth and/or nostrils • Neurological signs: ataxia, stiff limbs with muscle spasms, head pressing/circling, trembling, involuntary twitching, seizures **Criteria for reporting**: Clinical suspicion AND/OR any positive laboratory test result using the following methods: • Detection of agent: IHC, PCR, virus isolation • Detection of immune response: VN, ELISA **References**: OIE. (2017). *Manual for Diagnostic Tests for Terrestrial Animals (the Terrestrial Manual*). World Organisation for Animal Health. Online Access <http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.01.14_NIPAH_HENDRA.pdf> The Center for Food Security & Public Health. (2016). *Nipah Virus Infection*. Iowa State University. Online Access. <http://www.cfsph.iastate.edu/Factsheets/pdfs/nipah.pdf>.
24. Peste des petits ruminants	• **Pathogen**: Peste des petit ruminants (PPR) virus • **Susceptible species:** Goats (predominantly) and sheep, cattle, buffaloes, camels and some wild ruminant species • **Route of transmission:** By aerosols, contact of infectious ocular, nasal and oral secretions and fomites. • **Risk factors:** Contact with infected animals. • **Incubation period**: 21 days • **Location**: Africa, Asia and the Middle East.

	Clinical features: • Fever, mucopurulent oculonasal discharge, conjunctivitis and necrosis of mucosal membranes, crusting scabs along the lips. • 50-100% mortality rate in goat populations. **Criteria for reporting**: Clinical suspicion AND/OR any positive laboratory test result using the following methods: • Detection of agent: AGID, virus isolation, ELISA, PCR • Detection of immune response: cELISA, VN **References**: OIE. (2017*). Terrestrial Animal Health Code, (the Terrestrial Code*). World Organisation for Animal Health. Online Access < http://www.oie.int/index.php?id=169&L=0&htmfile=chapitre_ppr.htm> OIE. (2013). *Technical Disease Card*. Online Access <www.oie.int/fileadmin/Home/eng/Animal_Health_in_the_World/dpcs/pdf/Disease_cards/PESTE_DES_PETITS_RUMINANTS.pdf> The Center for Food Security & Public Health. (2015). *Peste des Petits Ruminants*. Iowa State University. Online Access. <http://www.cfsph.iastate.edu/Factsheets/pdfs/peste_des_petits_ruminants.pdf>. South Asia Pro-Poor Livestock Policy Programme. (2013). Peste des petits Ruminants (PPR) Control Programme. Online Access <http://sapplpp.org/ppr-control-programme.html#.WNTleTrauUk>.
25. Rabies	• **Pathogen**: *Lyssavirus*, *Rhabdoviridae* • **Susceptible species:** Mammals • **Route of transmission**: Saliva from the bite of an infected animal infected saliva entering an open wound or via mucous membrane • **Risk factors**: Animals smuggled from endemic countries. • **Incubation period**: Variable, considered to be 6 months. • **Location**: Asia, Africa. **Clinical features:** • Behavioural changes (fearfulness, aggression), excessive drooling, difficulty swallowing, staggering, paralysis and seizures. **Criteria for reporting**: Clinical suspicion AND/OR suspected cases of smuggling AND/OR any positive laboratory test result using the following methods: • Detection of agent: PCR, FAT • Detection of immune response: VN, ELISA **References**: OIE. (2017*). Terrestrial Animal Health Code, (the Terrestrial Code*). World Organisation for Animal Health. Online Access <http://www.oie.int/index.php?id=169&L=0&htmfile=chapitre_rabies.htm> OIE. (2017). *Manual for Diagnostic Tests for Terrestrial Animals (the Terrestrial Manual*). World Organisation for Animal Health. Online Access

	<http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.01.17_RABIES.pdf> Robinson, W., *Rabies in dogs: fatal virtually extinct disease*, Online access. <http://dogsaholic.com/care/rabies-in-dogs.html>
26. Rinderpest	• **Pathogen**: Rinderpest virus • **Susceptible species**: Cloven-hooved animals such as cattle (maintenance hosts), sheep, goats, pigs, buffalo, giraffes and warthog • **Route of transmission**: Contact with infected animals, through secretions and excretions (including discharges, saliva, milk, urine, faeces, semen and blood). • **Incubation period**: 21 days. • **Location**: Eradicated worldwide since 2011. **Clinical features:** • Extensive necrosis and erosions in the oral cavity, ocular and nasal discharges and bloody diarrhoea • Fever, depression, decreased appetite and decreased milk yield • Post-mortem findings: Linear engorgement and blackening of the crests of the folds of the caecum, colon and rectum, known as "tiger striping" or "zebra striping" **Criteria for reporting:** Any positive laboratory test result using the following methods**:** • Detection of agent: AGID, virus isolation, ELISA, PCR, IHC • Detection of immune response: ELISA **References**: OIE. (2017). *Manual for Diagnostic Tests for Terrestrial Animals (the Terrestrial Manual*). World Organisation for Animal Health. Online Access <http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.01.19_RINDERPEST.pdf> The Center for Food Security & Public Health. (2016). *Rinderpest*. Iowa State University. Online Access. <http://www.cfsph.iastate.edu/Factsheets/pdfs/rinderpest.pdf> OIE. (2013). *Technical Disease Card*. Online Access <http://www.oie.int/fileadmin/Home/eng/Media_Center/docs/pdf/Disease_cards/RINDERPEST-EN.pdf>. Merck Sharp & Dohme Corp. (2016). *Overview of Rinderpest. Merck Manual (Veterinary Manual).* Merck & Co. Online Access <http://www.merckvetmanual.com/generalized-conditions/rinderpest/overview-of-rinderpest>.

27. Salmonellosis caused by *Salmonella* Enteritidis	• **Pathogen**: *Salmonella enterica* subsp*. enterica* serovar Enteritidis • **Species**: [Zoonosis] Chickens are natural hosts but other birds can be affected • **Route of transmission**: Vertical transmission (in the reproductive tract) from infected hens to chicks. Horizontal transmission via contaminated feed, bedding, pests, water, housing, infected animals and people. It can be shed intermittently in faeces. Eggs are contaminated through through transovarial contamination, trans-shell contamination and eggshell contamination. • **Risk factors**: Poor biosecurity, exposure to infected animals (including pests such as rodents), infected people and contaminated environment. • **Incubation period:** 4 to 6 days **Clinical features**: • Depression, poor growth, weakness, diarrhoea and dehydration **Criteria for reporting**: Any positive laboratory test result using the following methods: • Detection of agent: culture, PCR **References**: OIE. (2017). *Manual for Diagnostic Tests for Terrestrial Animals (the Terrestrial Manual*). World Organisation for Animal Health. Online Access http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.09.08_SALMONELLOSIS.pdf The Center for Food Security & Public Health. (2013). *Salmonellosis*. Iowa State University. Online Access. <http://www.cfsph.iastate.edu/Factsheets/pdfs/nontyphoidal_salmonellosis.pdf>
28. Strangles	• **Pathogen**: *Streptococcus equi* subsp. *equi* • **Susceptible species**: Horses, donkeys and mules • **Route of transmission**: Direct contact with a diseased animal or contaminated stable or the water troughs, or through flies. • **Risk factors**: History of the disease in the country of origin/residence and/or with a history of an outbreak of the disease. • **Incubation period**: 3 to 14 days **Clinical features**: • Fever, mucoid to mucopurulent nasal discharge, depression and submandibular lymphadenopathy. • Horses with retropharyngeal lymph node involvement have difficulty swallowing, inspiratory respiratory noise and extended head and neck **Criteria for reporting**: Clinical suspicion AND/OR positive detection of the antigen AND/OR rising antibody titre detected using the following methods:

	• Detection of agent: PCR, culture of exudate from abscesses or nasal swab samples • Detection of immune response: ELISA **References**: Merck Sharp & Dohme Corp. (2016). *Strangles in Horses. Merck Manual (Veterinary Manual).* Merck & Co. Online Access <http://www.merckvetmanual.com/respiratory-system/respiratory-diseases-of-horses/strangles-in-horses>. Ontario Ministry of Agriculture, Food and Rural Affairs. (2003). Strangles in Horses. Online Access <http://www.omafra.gov.on.ca/english/livestock/horses/facts/03-037.htm>

29. Classical Swine fever	• **Pathogen:** Classical swine fever virus
	• **Susceptible species**: Swine
	• **Route of transmission:** Ingestion of meat from infected animals. Direct contact with the secretions, excretions and blood of infected animals and indirectly through fomites. Transplacental infection may create carrier piglets.
	• **Risk factors:**
	  ○ Import of infected pigs and meat from a country of origin/residence with a history of the disease and/or with a history of an outbreak of the disease.
	  ○ Exposure of pigs to garbage containing infected meat
	• **Incubation period:** 2 – 14 days in pigs exposed postnatally. Pigs exposed prenatally may be persistently infected and have an incubation period of several months.
	• **Location:** Asia, Central and South America, and parts of Europe and Africa.
	
	Clinical features:
	• Sudden death
	• Fever, weight loss, anorexia, vomiting, diarrhoea
	• Respiratory distress, excess pleural, pericardial and/or peritoneal fluid.
	• Reddening of the skin, in particular the ears and snout
	• Abortion, foetal death, resorption, mummification and still birth
	• In congenitally infected piglets: tremor, weakness, poor growth rates. Some may be clinically normal.
	
	Criteria for reporting: Clinical suspicion AND/OR any positive laboratory test result using:
	• Detection of agent: virus isolation, ELISA, PCR
	• Detection of immune response: ELISA, neutralisation peroxidase-linked assay
	
	References:
	OIE. (2017*). Terrestrial Animal Health Code, (the Terrestrial Code*). World Organisation for Animal Health. Online Access <http://www.oie.int/index.php?id=169&L=0&htmfile=chapitre_csf.htm>

	OIE. (2017). *Manual for Diagnostic Tests for Terrestrial Animals (the Terrestrial Manual*). World Organisation for Animal Health. Online Access <http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.08.03_CSF.pdf>. The Center for Food Security & Public Health. (2015). *Classical Swine Fever*. Iowa State University. Online Access <http://www.cfsph.iastate.edu/FastFacts/pdfs/classical_swine_fever.pdf> Marphavet JSC. Classical Swine Fever (Hog Cholera). Online Access <http://marphavet.com/en/news/Disease-Treatment/Classical-swine-Fever-Hog-Cholera-76/>.
30. Swine vesicular disease	• **Pathogen**: Swine vesicular disease virus (SVDV) • **Susceptible species:** Swine • **Route of transmission**: Direct contact with infected swine and their secretions, contaminated environment and ingestion of meat from infected pigs • **Risk factors:** Import of infected pigs from a country of origin/residence with a history of the disease and/or with a history of an outbreak of the disease. • **Incubation period**: 2 to 7 days • **Location**: Europe, Eastern Asia **Clinical features**: • Vesicles on coronary bands, heels of the feet occasionally on the lips, tongue, snout and teats • Lameness, pyrexia and anorexia **Criteria for reporting**: Clinical suspicion AND/OR any positive laboratory test result using the following methods: • Detection of agent: virus isolation, PCR, ELISA • Detection of immune response: ELISA **References**: OIE. (2013). *Technical Disease Card*. Online Access <http://www.oie.int/fileadmin/Home/eng/Animal_Health_in_the_World/docs/pdf/Disease_cards/SWINE_VESICULAR_DISEASE.pdf>. Pork checkoff. (2016) Swine Vesicular Disease in Pigs. Online Access <http://egashops.directedje.com/PorkStoreRetailer/product-details.asp?ID=420&CID=31&P=1>. OIE. (2017). *Manual for Diagnostic Tests for Terrestrial Animals (the Terrestrial Manual*). World Organisation for Animal Health. Online Access <http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.08.08_SVD.pdf>
31. Vesicular stomatitis	• **Pathogen**: Vesicular stomatitis virus • **Susceptible species:** [Zoonotic] Equids, bovids and swine. Sheep and goats tend to be resistant with few clinical signs. • **Route of transmission:** By arthropod vector transmission (e.g. sand flies, black flies, mosquitoes) or direct contact through broken skin or mucous membranes and contaminated fomites • **Incubation period**: 3 to 7 days. • **Location**: Southern Mexico, Central America and South America.

	Clinical features: • Vesicles, ulcers, erosions and crusting of muzzle, teats and feet. • Pyrexia • Lameness **Criteria for reporting:** Clinical suspicion AND/OR any positive laboratory test result using the following methods: • Detection of agent: virus isolation, PCR • Detection of immune response: c-ELISA, VN, CF **References**: OIE. (2017). *Manual for Diagnostic Tests for Terrestrial Animals (the Terrestrial Manual*). World Organisation for Animal Health. Online Access <http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.01.23_VESICULAR_STOMATITIS.pdf> OIE. (2013). *Technical Disease Card*. Online Access <http://www.oie.int/fileadmin/Home/eng/Animal_Health_in_the_World/docs/pdf/Disease_cards/VESICULAR_STOMATITIS.pdf>. Horsetalk.co.nz. (2017). Wyoming records first vesicular stomatitis case in a horse for 2015. Online Access <http://www.horsetalk.co.nz/2015/07/24/wyoming-records-first-vesicular-stomatitis-horse-2015/#axzz4cUsTi9yK> Colorado State University. (2016). Vesicular Stomatitis Virus (VSV). Online Access <http://csu-cvmbs.colostate.edu/vth/Pages/vesicular-stomatitis-presentation.aspx>.
32. Yellow fever	• **Pathogen**: Yellow fever virus • **Susceptible species**: [Zoonotic] Monkeys • **Route of Transmission**: Bites from infected mosquitoes: *Aedes* spp. and *Haemogogus* spp. mosquitoes • **Incubation period**: 3 to 6 days • **Location**: Africa, South America **Clinical features:** • Acute onset of fever, with jaundice appearing within 14 days of onset of first symptoms **Criteria for reporting**: Clinical suspicion AND/OR any positive laboratory test result using the following methods: • Detection of agent: virus isolation, PCR, IHC • Detection of immune response **References**: WHO. (2016). Yellow Fever. Online Access <http://www.who.int/mediacentre/factsheets/fs100/en/>. CDC. (2016). Vaccine Information Statements. Online Access <https://www.cdc.gov/vaccines/hcp/vis/vis-statements/yf.html>

Part A2: Diseases of mammals and birds (Notify within 72 hours)	
33. Aujeszky's disease	• **Pathogen:** Suid herpesvirus 1 (SuHV1) • **Susceptible Species**: Primarily pigs, the natural host, but it can also infect cattle, sheep, cats, dogs and rats. • **Route of transmission:** Direct transmission through nose to nose contact with infected pigs, the airborne route, fomites and venereal transmission. • **Risk factors:** Import of infected pigs and meat from a country of origin/residence with a history of the disease and/or with a history of an outbreak of the disease. • **Incubation period:** 2 to 6 days • **Location**: Europe, Asia, Latin America and Africa. **Clinical features:** • Neurological signs are seen. In piglets, signs include incoordination, weakness, high mortality and sudden death in piglets. In older/weaned pigs, signs include respiratory difficulties, fever, weight loss and reproductive losses such as abortion and birth of weak piglets. • In other animals, clinical signs include intense pruritus **Criteria for reporting:** Clinical suspicion AND/OR any positive laboratory test result using the following methods: • Detection of agent: virus isolation, PCR • Detection of immune response: ELISA, VN **References**: The Center for Food Security & Public Health. (2017). *Aujeszky's disease*. Iowa State University. Online Access. <http://www.cfsph.iastate.edu/Factsheets/pdfs/aujeszkys_disease.pdf>. OIE. (2017*). Terrestrial Animal Health Code, (the Terrestrial Code*). World Organisation for Animal Health. Online Access < http://www.oie.int/index.php?id=169&L=0&htmfile=chapitre_aujeszky.htm> OIE. (2017). *Manual for Diagnostic Tests for Terrestrial Animals (the Terrestrial Manual*). World Organisation for Animal Health. Online Access < http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.01.02_AUJESZKYS_DIS.pdf>
34. Avian infectious bronchitis	• **Pathogen**: Gammacoronavirus infectious bronchitis virus (IBV) • **Susceptible species**: Mainly in chickens; significant pathogen of commercial meat and egg type birds. Chickens and pheasants are the only species reported to be naturally infected. • **Route of transmission:** Air-borne route, direct chicken-to-chicken contact and indirectly through mechanical spread (equipment, egg packing materials, manure, farm visits, etc.) • **Risk factors:** Non-vaccinated, biosecurity breaches, introduction of new birds • **Incubation period:** 50 days • **Location:** Asia and Europe

	Clinical features: • Respiratory signs: dyspnoea, coughing, sneezing and tracheal rales • Conjunctivitis, and facial swelling, depression, reduced feed consumption and weight gain, decreased egg production and poor egg quality • Nephropathogenic strains can induce interstitial nephritis in young chicks • Post-mortem findings: exudates in respiratory tract. With secondary bacterial infection, caseous air sacculitis, perihepatitis and pericarditis can also be observed. Swollen, pale kidneys and tubules and ureters distended with urates. **Criteria for reporting**: Clinical suspicion AND/OR any positive detection of the antigen using the following methods: • Detection of agent: virus isolation, PCR • Detection of immune response: ELISA, HI, VN **References**: OIE. (2017*). Terrestrial Animal Health Code, (the Terrestrial Code*). World Organisation for Animal Health. Online Access <http://www.oie.int/index.php?id=169&L=0&htmfile=chapitre_aib.htm> OIE. (2017). *Manual for Diagnostic Tests for Terrestrial Animals (the Terrestrial Manual*). World Organisation for Animal Health. Online Access < http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.03.02_AIB.pdf> Merck Sharp & Dohme Corp. (2016). *Overview of Infectious Bronchitis in Poultry. Merck Manual (Veterinary Manual).* Merck & Co. Online Access <http://www.merckvetmanual.com/poultry/infectious-bronchitis/overview-of-infectious-bronchitis-in-poultry>. Cornell University, *Atlas of Avian Diseases*. Online Access <http://www.poultrydisease.ir/atlases/avian-atlas/search/disease/497.html>.
35. Avian infectious laryngotracheitis	• **Pathogen**: *gallid herpesvirus 1*, an alphaherpesvirus • **Susceptible species**: Mainly in chicken; but can affect pheasants, partridges and peafowl. • **Route of transmission:** Direct contact with infected birds (respiratory droplets), mechanical transmission via contaminated equipment, housing, human and other animals. The virus enters the bird through the eye, nose or mouth. • **Risk factors:** Non-vaccinated, biosecurity breaches, introduction of new birds • **Incubation period:** 14 days (chronic carriers may occur) • **Location:** Australia, North America **Clinical features:** • Respiratory signs: dyspnoea, coughing will be heard.

	• Post-mortem findings: haemorrhagic tracheitis with blood clots and blood stained mucus along the trachea. **Criteria for reporting:** Clinical suspicion AND/OR any positive detection of the antigen using the following methods: • Detection of agent: virus isolation, PCR, histopathology • Detection of immune response: ELISA, VN **References**: OIE. (2017*). Terrestrial Animal Health Code, (the Terrestrial Code*). World Organisation for Animal Health. Online Access < http://www.oie.int/index.php?id=169&L=0&htmfile=chapitre_ail.htm> OIE. (2017). *Manual for Diagnostic Tests for Terrestrial Animals (the Terrestrial Manual*). World Organisation for Animal Health. Online Access < http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.03.03_AVIAN_INF_LARYNGO.pdf> Queensland Government. (2017). *Infectious laryngotracheitis*. Online Access <https://www.daf.qld.gov.au/animal-industries/animal-health-and-diseases/a-z-list/infectious-laryngotracheitis>.
36. Avian mycoplasmosis (*M. gallisepticum* and *M. synoviae*)	• **Pathogen**: *Mycoplasma gallisepticum* (*MG*) and *M. Synoviae* (*MS*) • **Susceptible species**: Domestic poultry, passerine and psittacine birds • **Route of transmission:** Close contact between birds, fomites, vertical transmission to chicks • **Risk factors:** Non-vaccinated, biosecurity breaches, introduction of new birds/eggs • **Incubation period:** 6 to 21 days. **Clinical features:** • Chronic respiratory disease: coryza, conjunctivitis, sneezing, sinusitis, dyspnoea, nasal exudates • Decreased egg production, reduced feed efficiency, growth and egg production • Post-mortem findings: respiratory tract lesions in form of excess exudate, which may form amorphous masses in air sacs **Criteria for reporting:** Clinical suspicion AND/OR any positive laboratory test result using: • Detection of agent: PCR, culture • Detection of immune response: ELISA, HI **References**: OIE. (2017). *Manual for Diagnostic Tests for Terrestrial Animals (the Terrestrial Manual*). World Organisation for Animal Health. Online Access <http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.03.05_%20AVIAN_MYCO.pdf> The Center for Food Security & Public Health. (2007). *Avian Mycoplasmosis (Mycoplasma gallisepticum)*. Iowa State University. Online Access

	<http://www.cfsph.iastate.edu/Factsheets/pdfs/avian_mycoplasmosis_mycoplasma_gallisepticum.pdf>. The poultry site.com. (2010). *Diseases of poultry*. Online Access <http://kenanaonline.com/files/0032/32320/mycoplasma.htm>.
37. Avian tuberculosis	• **Pathogen**: Most commonly caused by *Mycobacterium avium* subsp. *avium*, and less frequently by *M. genavense*. • **Susceptible species**: [Zoonotic] Domestic and wild gallinaceous birds. • **Route of transmission:** Direct contact with infected birds, ingestion of contaminated feed and water and contact with contaminated environment • **Risk factors:** Contact with wild birds, inadequate diet, poor husbandry; poorly-ventilated aviaries • **Incubation period:** Chronic, affected birds are usually older than 1 year **Clinical features:** • Chronic and progressive wasting and weakness; diarrhoea; respiratory signs such as dyspnoea; granulomatous ocular lesions; sudden death • Post-mortem findings: primary lesions are found in the intestinal tract (deep ulcers filled with caseous material containing many mycobacterial cells); caseous lesions in liver and spleen; with liver and spleen enlargement **Criteria for reporting:** Clinical suspicion AND/OR any positive laboratory test result using the following methods: • Detection of agent: PCR, microscopic examination (stained), culture • Detection of immune response: tuberculin test **References**: OIE. (2017). *Manual for Diagnostic Tests for Terrestrial Animals (the Terrestrial Manual*). World Organisation for Animal Health. Online Access < http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.03.06_AVIAN_TB.pdf> Avian Biotech International. (2017). *Avian tuberculosis (Mycobacterium avium) PDD syndrome*. Online Access <http://www.avianbiotech.com/diseases/AvianTuberculosis.htm>. USGS National Wildlife Health Center. (2001). *Chapter 8 Tuberculosis.* Online Access <https://www.nwhc.usgs.gov/publications/field_manual/chapter_8.pdf>.
38. Black quarter (blackleg)	• **Pathogen**: *Clostridium chauvoei* • **Susceptible species**: Cattle and sheep. • **Route of transmission**: Clostridial spores found in contaminated feed or soil or inoculated through skin wounds or contaminated equipment. The spores enter the blood stream and remain in organs and muscles, which may be activated to multiply when the host

	undergoes muscle trauma (bulling injuries, injuries from feed barriers). • **Incubation period**: 1 to 5 days **Clinical features:** • Crepitant swellings of heavy muscles (in particular sudden onset of emphysematous, swelling on the hip, shoulder, chest, back and neck), • In cattle, signs may occur without any history of wounds, but may be precipitated by bruising or excessive exercise • In sheep, signs are preceded by wound infection from injury (castration, shearing, docking) • Post-mortem lesions: Muscles (including myocardium and diaphragm) with dark red to black and dry or spongy appearance with sweet odour, infiltrated with small bubbles **Criteria for reporting:** Clinical suspicion AND/OR any positive laboratory test result using the following methods: • Detection of agent: IFAT, histopathology **References**: Merck Sharp & Dohme Corp. (2016). Blackleg. *MSD Manual (Veterinary Manual).* Merck & Co. Online Access <https://www.msdvetmanual.com/generalized-conditions/clostridial-diseases/blackleg> Animal & Plant Health Agency. (2007). Livestock & Wildlife Disease Diagnosis at APHA. Online Access <http://ahvla.defra.gov.uk/documents/surveillance/sub-handbook.pdf> Wood, P. (2017). Clostridial disease in cattle: updates and developments. Online Access <https://www.vettimes.co.uk/app/uploads/wp-post-to-pdf-enhanced-cache/1/clostridial-disease-in-cattle-updates-and-developments.pdf> Useh, N.M., Nok, A.J. and Esievo, K.A.N. (2006). Blackleg in ruminants. CAB Reviews Perspectives in Agriculture Veterinary Science Nutrition and Natural Resources. Online Access <https://www.researchgate.net/publication/248908646_Blackleg_in_ruminants>
39. Bluetongue	• **Pathogen**: Bluetongue virus • **Susceptible species**: Cattle, sheep, goats, deer, buffaloes and camelids. • **Route of transmission:** Through biting midges (C*ulicoides* spp.) • **Risk factors:** Presence of competent vectors and their habitats, poor biosecurity, import of infected animals from a country of origin/residence with a history of the disease and/or with a history of an outbreak of the disease. • **Incubation period:** 2 to 10 days. • **Location:** Found worldwide. **Clinical features:** Cattle and sheep rarely show clinical signs. In sheep, clinical signs include: ▪ Pyrexia, respiratory difficulty

	▪ Erosions or ulcers in the oral cavity, excessive salivation, nasal discharge ▪ Hyperaemia and swelling of the mouth, tongue, head, oedema and vasculitis at the extremities, resulting in lameness. **<u>Criteria for reporting:</u>** Clinical suspicion AND/OR any positive laboratory test result using the following methods: • Detection of agent: PCR, virus isolation • Detection of immune response: ELISA **References**: OIE. (2017*). Terrestrial Animal Health Code, (the Terrestrial Code*). World Organisation for Animal Health. Online Access < http://www.oie.int/index.php?id=169&L=0&htmfile=chapitre_bluetongue.htm> OIE. (2017). *Manual for Diagnostic Tests for Terrestrial Animals (the Terrestrial Manual*). World Organisation for Animal Health. Online Access < http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.01.03_BLUETONGUE.pdf> Merck Sharp & Dohme Corp. (2016). *Overview of Bluetongue. Merck Manual (Veterinary Manual).* Merck & Co. Online Access <http://www.merckvetmanual.com/generalized-conditions/bluetongue/overview-of-bluetongue>. BBC. (2008). *Q&A Bluetongue disease.* Online Access <http://news.bbc.co.uk/2/hi/7008901.stm>.
40. Bovine anaplasmosis	• **Pathogen**: *Anaplasma marginale* • **Susceptible species**: [Zoonotic] Ruminants including cattle, sheep, goats and buffalo. • **Route of transmission**: ticks in the family Ixodidae, and species including *Rhipicephalus* (*Boophilus*) spp, *Dermacentor* spp, *Ixodes*, *Hyalomma* and *Argas*. • **Incubation period:** 45 to 90 days. **<u>Clinical features:</u>** • Pale mucous membranes, jaundice and sudden death • Rapid loss of milk production and weight **<u>Criteria for reporting:</u>** Any positive laboratory test result using the following methods: • Detection of agent: microscopic examination of stained smears, PCR • Detection of immune response: cELISA, CFT **References**: OIE. (2017). *Manual for Diagnostic Tests for Terrestrial Animals (the Terrestrial Manual*). World Organisation for Animal Health. Online Access <http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.04.01_BOVINE_ANAPLASMOSIS.pdf> The Center for Food Security & Public Health. (2013). *Ehrlichiosis and Anaplasmosis: Zoonotic Species*. Iowa State University. Online Access.

	<http://www.cfsph.iastate.edu/Factsheets/pdfs/ehrlichiosis.pdf> Merck Sharp & Dohme Corp. (2016). *Anaplasmosis. MSD Manual (Veterinary Manual).* Merck & Co. Online Access <http://www.msdvetmanual.com/circulatory-system/blood-parasites/anaplasmosis> UC Davis Veterinary Medicine, Anaplasmosis: a re-emerging cattle disease in California. Online Access. <http://www.vetmed.ucdavis.edu/whatsnew/article.cfm?id=2665> FAO. Corporate Document Repository, Chapter 3. Online Access. <http://www.fao.org/docrep/003/t0756e/T0756E04.htm>.
41. Bovine babesiosis	• **Pathogen**: *Babesia bovis*, *B. bigemina* and *B. divergens.* Other species include B*. major*, *B. ovata*, *B. ocultans* and *B. jakimovi* • **Susceptible species**: [Zoonotic] Cattle, buffalo and white-tailed deer (for *B. bovis* and *B. bigemina*). For *B. diverns*, it is zoonotic, and species affected include cattle, reindeer and gerbils. • **Route of transmission**: By the tick vector. Can also be transmitted by direct inoculation of biting flies and fomites contaminated by infected blood. Calves can be infected in utero provided pathological changes to the placenta occur. • **Incubation period**: 2 to 3 weeks or longer after tick infestation • **Location:** Asia, Africa, Central and South America, southern Europe and Australia. **Clinical features:** • Pyrexia, anorexia, depression, tachypnoea, tachycardia, diarrhoea and constipation • Production of dark reddish-brown urine • Pale and icteric mucous membranes • Neurological signs: incoordination, teeth grinding (in cattle infected with *B. bovis*) • Abortion • Post-mortem findings: enlarged dark friable spleen and liver, distended gallbladder with thick granular bile, dark red or black kidneys. **Criteria for reporting:** Any positive laboratory test result using the following methods**:** • Detection of agent: microscopic examination of stained smears, PCR • Detection of immune response: ELISA, cELISA, IFAT **References**: The Center for Food Security & Public Health. (2008). *Bovine Babesiosis*. Iowa State University. Online Access. <http://www.cfsph.iastate.edu/Factsheets/pdfs/bovine_babesiosis.pdf>

	OIE. (2017). *Manual for Diagnostic Tests for Terrestrial Animals (the Terrestrial Manual*). World Organisation for Animal Health. Online Access < http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.04.02_BOVINE_BABESIOSIS.pdf>
42. Bovine brucellosis	• **Pathogen**: *Brucella abortus*, less frequently by *B. melitensis* • **Susceptible species:** [Zoonotic] All mammals are susceptible. Maintenance hosts for *B. abortus* include cattle, while sheep and goats are the reservoir hosts for *B. melitensis.* • **Route of transmission:** Contact with reproductive materials (placenta, birth fluids) and discharge from the reproductive organs of infected animals when they abort or gives birth, ingestion of raw milk/colostrum from infected animals and through artificial insemination. • **Risk factors:** Extensive farming system, poor biosecurity, contact with wildlife, mix animal species on farms. • **Incubation period**: Varies with species and stage of gestation at infection. **Clinical features:** • In cows: abortions, stillbirths, weak offspring and retained placenta in late gestation. • In bulls: male infertility, orchitis, epididymitis. • Other signs include: arthritis, synovitis and endocarditis. **Criteria for reporting:** Clinical suspicion AND/OR any positive laboratory test result using the following methods: • Detection of agent: culture, PCR of uterine discharges, aborted foetuses, udder secretions or tissues such as lymph nodes and reproductive organs • Detection of immune response: ELISA, Rose Bengal Test, Tube Agglutination Test **References**: OIE. (2017*). Terrestrial Animal Health Code, (the Terrestrial Code*). World Organisation for Animal Health. Online Access < http://www.oie.int/index.php?id=169&L=0&htmfile=chapitre_bovine_brucellosis.htm> OIE. (2017). *Manual for Diagnostic Tests for Terrestrial Animals (the Terrestrial Manual*). World Organisation for Animal Health. Online Access < http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.01.04_BRUCELLOSIS.pdf> European Association of Zoo and Wildlife Veterinarians (EAZWV) Transmissible Disease Fact Sheet – Bovine Brucellosis (Brucella abortus) A Case-Control Study of Risk Factors for Bovine Brucellosis Seropositivity in Peninsular Malaysia. Mukhtar Salihu Anka et. al. PLoS One. 2014; 9(9): e108673

	Epidemiosurveillance of brucellosis. R. Adone & P. Pasquali. Rev. sci. tech. Off. int. Epiz., 2013, 32 (1), 199-205 The Center for Food Security & Public Health. (2009). *Bovine Brucellosis: Brucella abortus*. Iowa State University. Online Access. <http://www.cfsph.iastate.edu/Factsheets/pdfs/brucellosis_abortus.pdf>. Dairy Knowledge Portal. *Brucellosis (Contagious Abortion).* Online Access. <http://dairyknowledge.in/article/brucellosis-contagious-abortion>.
43. Bovine genital campylobacteriosis	• **Pathogen**: *Campylobacter fetus* subsp. *venerealis* or *C. fetus fetus.* Bovine genital campyobacetirosis (BGC)is also known as bovine venereal campylobacteriosis (BVC) • **Susceptible species**: [Zoonotic] Cattle, sheep, goats and buffalo. *C. fetus fetus* is an opportunistic pathogen in immuno-compromised individuals that causes septicemia. • **Route of transmission**: transmitted venereally and also by contaminated instruments, bedding, or by artificial insemination using contaminated semen. Infected bulls and cows may become permanent carriers. • **Incubation period**: 3 to 5 days **Clinical features:** • Mucopurulent endometriits causing early embryonic death, infertilty, abortion (associated with infection with *C. fetus* subsp *fetus*), irregular oestrus cycles, prolonged luteal phase **Criteria for reporting:** Clinical suspicion AND/OR any positive laboratory test result using the following methods: • Detection of agent: PCR, IFAT, ELISA, culture • Detection of immune response: ELISA **References**: OIE. (2017). *Manual for Diagnostic Tests for Terrestrial Animals (the Terrestrial Manual*). World Organisation for Animal Health. Online Access <http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.04.04_BGC.pdf> Merck Sharp & Dohme Corp. (2016). *Overview of Bovine Genital Campylobacteriosis. MSD Manual (Veterinary Manual).* Merck & Co. Online Access <http://www.msdvetmanual.com/reproductive-system/bovine-genital-campylobacteriosis/overview-of-bovine-genital-campylobacteriosis> The Center for Food Security & Public Health. (2013). Zoonotic Campylobacteriosis. Iowa State University. Online Access. <http://www.cfsph.iastate.edu/Factsheets/pdfs/campylobacteriosis.pdf>

44. Bovine malignant catarrhal fever (Bovine malignant catarrh)	• **Pathogen**: Ovine herpesvirus 2 (OvHV-2) and alcelaphine herpesvirus-1 (AlHV-1). • **Susceptible species**: Species of subfamily Bovinae (e.g. cattle, bison, water buffalo, antelope, guar banteng) and family Cervidae (e.g. deer, reindeer, moose), but it is also recognised in pigs (family Suidae), giraffe (family Giraffidae). OvHV-2 is present in sheep (Ovis aries) as a subclinical infection while AlHV-1 is maintained subclinically in infected wildebeest (*Connochaetes* spp.) • **Route of transmission**: Direct contact with sheep (for OvHV-2), through nasal and ocular secretions and in utero. Latent infections and recrudescence may be possible. • **Incubation period**: 11 – 73 days (for OvHV-2) and 11 – 34 days (for AlVH-1) • **Location**: Worldwide. OvHV-2 associated MCF is the predominant form outside Africa while AlHV-1 associated MCF is found in sub-Saharan Africa. **Clinical features:** • Pyrexia, oculonasal discharge, bilateral corneal opacity, encrusted muzzle and nares, dyspnoea, open-mouth breathing and salivation • Diarrhoea, hyperaemic oral mucosa with necrosis and erosions on the tips of the buccal papillae • Neurological signs: hyperaestheisa, incoordination, nystagmus and head pressing • Sudden death **Criteria for reporting:** Any positive laboratory test result using the following methods: • Detection of agent: PCR, IFAT, ELISA, culture • Detection of immune response: ELISA **References**: OIE. (2017). *Manual for Diagnostic Tests for Terrestrial Animals (the Terrestrial Manual*). World Organisation for Animal Health. Online Access <http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.04.14_MCF.pdf> The Center for Food Security & Public Health. (2016). *Malignant Catarrhal Fever*. Iowa State University. Online Access. <http://www.cfsph.iastate.edu/Factsheets/pdfs/malignant_catarrhal_fever.pdf> OIE. (2013). *Technical Disease Card*. Online Access <http://www.oie.int/fileadmin/Home/eng/Animal_Health_in_the_World/docs/pdf/Disease_cards/MALIGNANT_CATHARRAL_FEVER.pdf>. NADIS. (2018). Malignant Catarrhal Fever (MCF). Online Access <http://www.nadis.org.uk/bulletins/malignant-catarrhal-fever-(mcf).aspx>

45. Caprine arthritis/encephalitis	• **Pathogen**: Caprine arthritis encephalitis virus (CAEV) • **Susceptible species**: Goats and to a lesser extent, sheep. • **Route of transmission**: Infected dams to their kids; by the ingestion of virus-containing milk, colostrum, and respiratory secretions • **Incubation period**: highly variable, infected when young and can develop the disease months or years later. CAEV-associated encephalitis typically occurs in kids 2 to 6 months of age, polyarthritis is seen in adult goats **Clinical features:** • Neurological signs: Lameness, ataxia, paresis (in 2 to 6 month old kids) • Distension of the joint capsule • Dyspnoea due to chronic interstitial pneumonia • Chronic mastitis **Criteria for reporting:** Clinical suspicion AND/OR any positive laboratory test result using: • Detection of agent: virus isolation, PCR • Detection of immune response: AGID, ELISA **References**: OIE. (2017). *Manual for Diagnostic Tests for Terrestrial Animals (the Terrestrial Manual*). World Organisation for Animal Health. Online Access <http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.07.02-03_CAE_MV.pdf> The Center for Food Security & Public Health. (2015). *Small Ruminant Lentiviruses*. Iowa State University. Online Access. <http://www.cfsph.iastate.edu/Factsheets/pdfs/maedi_visna_and_caprine_arthritis_encephalitis.pdf> Extension. (2017). Caprine Arthritis Encephalitis (CAE). Online Access <http://articles.extension.org/pages/27023/caprine-arthritis-encephalitis-cae>
46. Caprine/ovine brucellosis	• **Pathogen**: *Brucella ovis* • **Susceptible species:** Sheep and deer (*Odocoileus virginianus*) • **Route of transmission:** Venereal transmission: During mating, semen of infected rams, which may persistently shed it. Ewes may shed *B. ovis* in vaginal discharges and milk. • **Risk factors:** Extensive farming system, poor biosecurity, mix animal species on farms, import of infected animals from a country of origin/residence with a history of the disease and/or with a history of an outbreak of the disease. • **Incubation period**: 3 to 8 weeks. • **Location**: Australia, New Zealand, North and South America, South Africa and Europe. **Clinical features:** • Pyrexia, epididymitis, orchitis and impaired fertility in rams. • Poor quality semen.

	Criteria for reporting: Clinical suspicion AND/OR any positive laboratory test result using the following methods: • Detection of agent: culture, PCR • Detection of immune response: Rose Bengal test **References**: OIE. (2017*). Terrestrial Animal Health Code, (the Terrestrial Code*). World Organisation for Animal Health. Online Access < http://www.oie.int/index.php?id=169&L=0&htmfile=chapitre_bovine_brucellosis.htm> OIE. (2017). *Manual for Diagnostic Tests for Terrestrial Animals (the Terrestrial Manual*). World Organisation for Animal Health. Online Access < http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.01.04_BRUCELLOSIS.pdf> A Case-Control Study of Risk Factors for Bovine Brucellosis Seropositivity in Peninsular Malaysia. Mukhtar Salihu Anka et. al, PLoS One. 2014; 9(9): e108673 Epidemiosurveillance of brucellosis. R. Adone & P. Pasquali. Rev. sci. tech. Off. int. Epiz., 2013, 32 (1), 199-205 The Center for Food Security & Public Health. (2009). *Ovine and Caprine Brucellosis*. Iowa State University. Online Access. <http://www.cfsph.iastate.edu/Factsheets/pdfs/brucellosis_melitensis.pdf>.
47. Contagious agalactia	• **Pathogen**: *Mycoplasma agalactiae* (*Ma*), *M. capricolum* subsp. *capricolum* (*Mcc*), *M. mycoides* subsp. *capri* (*Mmc*) and *M. putrefaciens.* • **Susceptible species**: Sheep and goats • **Route of transmission**: by the digestive route; ingesting small amounts of the bacteria from a communal water trough, urine, faeces, nasal and ocular discharges and secretions such as milk. • **Incubation period**: 1 – 8 weeks. **Clinical features:** • Agalactia, decreased or ceased milk production • Change in the colour and consistency of milk (greenish-yellow or grayish-blue appearance, watery to lumpy) • Abortion, mastitis, swollen joints and keratoconjunctivitis **Criteria for reporting:** Any positive laboratory test result using the following methods: • Detection of agent: culture, PCR • Detection of immune response: CFT, ELISA **References**: OIE. (2017). *Manual for Diagnostic Tests for Terrestrial Animals (the Terrestrial Manual*). World Organisation for Animal Health. Online Access <http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.07.04_CONT_AGALACT.pdf>

	The Center for Food Security & Public Health. (2009). *Contagious Agalactiae*. Iowa State University. Online Access. <http://www.cfsph.iastate.edu/Factsheets/pdfs/contagious_agalactia.pdf> OIE. (2018). *General Disease Information Sheets*. Online Access <http://www.oie.int/doc/ged/d8479.pdf> Priarie View A & M University. (2017). Contagious Agalactia. Online Access. <http://cahsspvd.pvamu.edu/home/animal-health-issues/contagious-agalactia/>
48. Contagious caprine pleuropneumonia	• **Pathogen**: *Mycoplasmacapricolum* subsp. *capripneumoniae* • **Susceptible species**: Goats and some wild ruminant species • **Route of transmission**: during close contact by the inhalation of respiratory droplets. • **Incubation period**: 45 days (chronic carriers may occur) • **Location**: Africa and the Middle East **Clinical features:** • Acute: high fever, lethargy, anorexia, coughing and labored respiration, abortion, frothy nasal discharge • Chronic: cough and nasal discharge • Post-mortem findings: serofibrinous pleuritis with straw-colored pleural effusion in the thorax, nodules on the lung surrounded by areas of congestion, lung consolidationa and necrosis, enlarged bronchial lymph nodes **Criteria for reporting:** Any positive laboratory test result using the following methods: • Detection of agent: culture, PCR • Detection of immune response: CFT, latex agglutination, c-ELISA **References**: OIE. (2017*). Terrestrial Animal Health Code, (the Terrestrial Code*). World Organisation for Animal Health. Online Access <http://www.oie.int/index.php?id=169&L=0&htmfile=chapitre_ccpp.htm> OIE. (2017). *Manual for Diagnostic Tests for Terrestrial Animals (the Terrestrial Manual*). World Organisation for Animal Health. Online Access <http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.07.05_CCPP.pdf> The Center for Food Security & Public Health. (2015). *Contagious Caprine Pleuropneumonia*. Iowa State University. Online Access <http://www.cfsph.iastate.edu/Factsheets/pdfs/contagious_caprine_pleuropneumonia.pdf> OIE. (2013). *Technical Disease Card*. Online Access <http://www.oie.int/fileadmin/Home/eng/Animal_Health_in_the_World/docs/pdf/Disease_cards/CONTAGIOUS_CAPRINE_PLEURO.pdf>

49.Cysticercosis of bovine and porcine origin	• **Pathogen**: Larval cysts (metacestodes) of cestodes in the family *Taenia spp*. (tapeworms), including *T. solium, T. saginata, T. asiatica and T. hydatigena,* adults of which occur in the intestine of humans and dogs. • **Susceptible species:** [Zoonotic] Bovine and swine are the intermediate hosts while humans, dogs or wild Canidae are the definitive hosts. • **Route of transmission:** Eggs and proglottids are shed by the definitive hosts in the faeces, which infect susceptible intermediate hosts. Intermediate hosts transmit *Taenia* spp. if their tissues are ingested. • **Risk factors:** Close proximity of dogs and livestock (particularly sheep), ingestion of carasses of animals, feeding raw or undercooked carcasses. • **Incubation period:** Variable. **Clinical features:** • Presence of cysts in various organs and muscles detected on meat inspection **Criteria for reporting:** Clinical suspicion AND/OR any positive laboratory test result using: • Detection of agent: microscopic examination, PCR Diagnosis of metacestodes in animals is usually at meat inspection or necropsy. Detection of eggs or segments in faeces of infected definitive hosts, via flotation tests **References**: OIE. (2017*). Terrestrial Animal Health Code, (the Terrestrial Code*). World Organisation for Animal Health. Online Access < http://www.oie.int/index.php?id=169&L=0&htmfile=chapitre_taenia_solium.htm > The Center for Food Security & Public Health. (2005). *Taenia infections*. Iowa State University. Online Access <http://www.cfsph.iastate.edu/Factsheets/pdfs/taenia.pdf>.
50. Dermatophilosis	• **Pathogen**: *Dermatophilus congolensis* • **Susceptible specie**s: [Zoonotic] Equids • **Route of transmission**: organism that causes dermatophilosis is found on the skin of diseased animals and also carrier animals that show no signs. Spread of the disease occurs by direct contact between animals or through exposure to contaminated surroundings or by vectors, particularly flies and ticks. • **Incubation period**: 2 weeks but can range 1 day to a month **Clinical features:** • Equids with matting of hair with paintbrush appearance with scab or crust with pus and exposure in rain for long periods of time **Criteria for reporting:** Any positive laboratory test result using:

	• Detection of agent: microscopic examination, culture, PCR, immunofluorescence staining **References**: The Center for Food Security & Public Health. (2006). *Dermatophilosis*. Iowa State University. Online Access. <http://www.cfsph.iastate.edu/FastFacts/pdfs/dermatophilosis_F.pdf>. AfrimashConnect , 2016, Dermatophilosis (Kirchi) in Livestock Animals, <http://connect.afrimash.com/dermatophilosis-kirchi-in-livestock-animals/>.

51.Duck virus hepatitis	• **Pathogen**: duck hepatitis A virus (DHAV) and duck astrovirus type 1 (DAstV-1) and type 2 (DAstV-2)
	• **Susceptible species**: Ducks, geese and swans
	• **Route of transmission:** Direct contact between birds, with virus excreted in faeces; Indirect contact with virus via fomites (e.g. brooders, water, feed, equipment).
	• **Risk factors:** Contact with wild waterfowl; inadequate pest control measures
	• **Incubation period:** 7 days
	• **Location:** Asia
	
	Clinical features:
	• Lethargy and ataxia, followed by opisthotonos and death,
	• Polydipsia (for DHV Type II)
	• Post-mortem findings:
	  • DVH Type I and DVH Type III: Enlarged liver, with distinct petechial and ecchymotic haemorrhages. Spleen enlargement and swelling of the kidney with some congestion of renal blood vessels.
	  • DVH Type II: Multiple haemorrhages with both punctate and confluent bands in the liver, swollen pale kidneys with congested blood vessels, and enlarged spleens.
	
	Criteria for reporting: Any positive laboratory test result using the following methods:
	• Detection of agent: virus isolation, PCR
	• Detection of immune response: VN
	
	References:
	OIE. (2017*). Terrestrial Animal Health Code, (the Terrestrial Code*). World Organisation for Animal Health. Online Access < http://www.oie.int/index.php?id=169&L=0&htmfile=chapitre_dvh.htm>
	
	OIE. (2017). *Manual for Diagnostic Tests for Terrestrial Animals (the Terrestrial Manual*). World Organisation for Animal Health. Online Access < http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.03.08_DVH.pdf>
	
	Merck Sharp & Dohme Corp. (2016). *Duck Viral Hepatitis. Merck Manual (Veterinary Manual).* Merck & Co. Online Access

	<http://www.msdvetmanual.com/poultry/duck-viral-hepatitis/overview-of-duck-viral-hepatitis>. The Poultry Site. (2011). *Major Viral Diseases of Waterfowl and their Control.* Online Access <http://www.thepoultrysite.com/articles/2051/major-viral-diseases-of-waterfowl-and-their-control/>
52. Duck Virus Enteritis (duck plaque)	• **Pathogen**: anatid herpesvirus-1 or DVE virus, member of the *Alphaherpesvirinae* subfamily of the *Herpesviridae*. • **Susceptible species**: Ducks, geese and swans • **Route of transmission**: Direct contact from infected to susceptible ducks; Indirect contact with contaminated environment • **Risk factors**: Flocks with access to bodies of water cohabited with free-living waterfowl • **Incubation period**: 3 to 7 days, but may be chronic • **Location**: America. **Clinical features:** • Photophobia, polydipsia, loss of appetite, ataxia, nasal discharge, diarrhoea, reduced egg production • Post-mortem findings: Vascular damage, with tissue haemorrhages, free blood in the body cavities and intestinal lumen, and range of lesions affecting the digestive tract mucosa. Pin-point haemorrhages and white foci in the liver. **Criteria for reporting:** Any positive laboratory test result using the following methods: • Detection of agent: virus isolation, PCR **References:** OIE. (2017). *Manual for Diagnostic Tests for Terrestrial Animals (the Terrestrial Manual*). World Organisation for Animal Health. Online Access < http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.03.07_DVE.pdf> Merck Sharp & Dohme Corp. (2018). *Duck Viral Enteritis. Merck Manual (Veterinary Manual).* Merck & Co. Online Access <https://www.merckvetmanual.com/poultry/duck-viral-enteritis/overview-of-duck-viral-enteritis>
53. Echinococcosis/ hydatidosis	• **Pathogen:** Cestodes belonging to the genus *Echinococcus*. At present, four species of Echinococcus are recognised, namely *Echinococcus granulosus* (cystic echinococcosis), *E. multilocularis* (alveolar echinococcosis), *E. oligarthrus* and *E. vogeli*. • **Susceptible species**: [Zoonotic] Carnivores are the definitive hosts, where the adult worm live in the intestines. Almost any mammal including canids, ungulates, marsupials and humans, can be the intermediate host, where the worm form cysts in various organs. • **Route of transmission:** Definitive hosts become infected when they ingest cysts (metacestodes) from tissues of intermediate hosts. Intermediate hosts become infected when they ingest gravid

	proglottids or eggs shed in faeces. Insects may act as mechanical vectors. • **Risk factors:** Feeding viscera of intermediate hosts to dogs • **Incubation period:** Variable. **<u>Clinical features:</u>** ○ Reduced growth, decreased milk, meat wool production, reduced birth rate and losses at condemnation of organs at PME. ○ For *E. granulosus*: on meat inspection, cysts can be found most frequently in the liver and lungs, but they can also develop in other internal organs, including the central nervous system, the skeletal muscles and in the marrow cavity of bones. The cysts of *E.granulosus* vary greatly in size and shape (typically unilobular, but sometimes multilobed or multilobular), and may be present in large numbers in one or several organs. ○ For *E. multilocularis*: lesions may be found in the liver, lungs and brain. **<u>Criteria for reporting:</u>** Clinical suspicion (observation of a cyst) AND/OR any positive laboratory test result using the following methods: • Detection of agent: microscopic examination **References**: OIE. (2017*). Terrestrial Animal Health Code, (the Terrestrial Code*). World Organisation for Animal Health. Online Access < http://www.oie.int/index.php?id=169&L=0&htmfile=chapitre_echinococcus_granulosus.htm> OIE. (2017). *Manual for Diagnostic Tests for Terrestrial Animals (the Terrestrial Manual*). World Organisation for Animal Health. Online Access < http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.01.06_ECHINOCOCCOSIS.pdf> OIE. (2017*). Terrestrial Animal Health Code, (the Terrestrial Code*). World Organisation for Animal Health. Online Access < http://www.oie.int/index.php?id=169&L=0&htmfile=chapitre_echinococcus_multilocularis.htm> WHO. (2001). *WHO/OIE Manual on Echinococcosis in Humans and Animals*. Online Access. <www.who.int/echinococcosis/resources/929044522X/en> OIE. (2018) *General Disease Information Sheets*. Online Access <http://www.oie.int/doc/ged/D13941.PDF>.
54. Enzootic bovine leucosis	• **Pathogen**: Bovine leukaemia virus (BLV), of the family Retroviridae • **Susceptible species**: Cattle • **Route of transmission**: in utero or when suckling, close contact, infected blood, through contact with secretion, semen, milk and colostrum of infected animals • **Incubation period**: lymphosarcomas are most common in animals 4 to 8 years old.

	Clinical features: • Tumours in various internal organs in animals, resulting in signs associated with the location of the tumours (dyspnoea, tachycardia, etc.) • 30 – 70% of infected cattle may develop persistent lymphocytosis. **Criteria for reporting:** Clinical suspicion (observation of a tumour) AND any positive laboratory test result using the following methods: • Detection of agent: virus isolation, PCR **References**: OIE. (2017). *Manual for Diagnostic Tests for Terrestrial Animals (the Terrestrial Manual*). World Organisation for Animal Health. Online Access <http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.04.10_EBL.pdf>
55. Epizootic lymphangitis	• **Pathogen**: dimorphic fungus, *Histoplasma capsulatum* var. *farciminosum*. • **Susceptible Species**: Equids and to a lesser extent, cattle. • **Route of transmission**: Biting flies, ticks, and contact with infected material with broken skin through wounds and nasal and ocular exudates of infected animals or soil. • **Incubation period**: several weeks to 2 months • **Location**: Mediterranean region, Africa and Asia. **Clinical features:** • Skin lesions, crusts and ulcers on extremities, chest wall, face, nostrils and neck. **Criteria for reporting**: Clinical suspicion AND any positive laboratory test result using the following methods: • Detection of agent: culture, microscopic examination of smears from exudates **References**: The Center for Food Security & Public Health. (2009). *Epizootic Lymphangitis*. Iowa State University. Online Access. <http://www.cfsph.iastate.edu/Factsheets/pdfs/epizootic_lymphangitis.pdf>. Church, S.L. (2014) Epizootic Lymphangitis: A working equid disease. Online Access <http://www.thehorse.com/articles/33316/epizootic-lymphangitis-a-working-equid-disease>.
56. Equine encephalosis	• **Pathogen**: Equine encephalosis virus • **Susceptible species**: Equid • **Route of transmission**: Through biting midges (*Culicoides* spp.) • **Incubation period**: 3 to 6 days **Clinical features:** • Neurological signs: Stiff facial expression, stiffness of mouth and commissures • Fever, tachycardia, tachypnoea, oedema, abortion

	• Post-mortem findings: ○ Venous congestion, fatty liver degeneration, oedema in the brain, catarrhal enteritis (sharply demarcated) **<u>Criteria for reporting</u>**: Clinical suspicion AND/OR any positive laboratory test result using the following methods: • Detection of agent: PCR **References**: Dhama, K., Pawaiya, R.V.S., Karthik, K., Chakraborty, S., Tiwari, R. and Verma, A.K. (2014). Equine encephalosis virus (EEV): A review, Asian Journal of Animal and Veterinary Advances. Online Access <http://docsdrive.com/pdfs/academicjournals/ajava/0000/61682-61682.pdf>
57. *Escherichia coli* O157:H7	• **Pathogen**: *Escherichia coli* O157:H7 • **Susceptible species**: [Zoonosis] Ruminants (such as cattle, sheep and goats) have been identified as maintenance hosts. *E.coli* O157:H7 does not cause illness in animals but may cause enteric disease in young animals. Cattle (main carriers), sheep, goats, deer, poultry, pigs, domestic animals (e.g. dogs). Humans get intestinal diseases, with severe cases leading to kidney problems (Haemolytic Uraemic Syndrome). • **Route of transmission:** Faecal-oral route through ingestion of bacteria in faeces of infected animals, or by exposure to items contaminated with faeces (e.g. food or water) or non-living objects (fomites) • **Risk factors:** Poor animal husbandry; dietary stress; feed type; intensive farming systems • **Incubation period:** neonatal calves less than 2 days old may develop signs in experimental infections; 1 – 10 days in humans **<u>Clinical features:</u>** • Diarrhoea and other gastrointestinal signs in young ruminants. **<u>Criteria for reporting</u>:** Any positive laboratory test result using the following methods: • Detection of agent: culture, PCR **References**: OIE. (2017). *Manual for Diagnostic Tests for Terrestrial Animals (the Terrestrial Manual*). World Organisation for Animal Health. Online Access <http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.09.10_VERO_E_COLI.pdf> CDC. E.coli. Online Access. <https://www.cdc.gov/ecoli> The Center for Food Security & Public Health. (2016). *Enterohemorrhagic Escherichia coli and Other E. coli causing Hemolytic Uremic Syndrome*. Iowa State University. Online Access. <http://www.cfsph.iastate.edu/Factsheets/pdfs/e_coli.pdf>.

	NADIS. (2018). Pig Health – Neonatal Colicobacillosis. Online Access <http://www.nadis.org.uk/bulletins/neonatal-colibacillosis.aspx>.
58. Fowl cholera	• **Pathogen**: *Pasteurella multocida* • **Species:** All bird spp. • **Route of transmission:** Nasal exudate, faeces, contaminated soil, fomites. Chronic carrier state possible. • **Risk factors:** Turkeys and waterfowls are more susceptible than chicken. High density housing and concurrent infections. • **Incubation period**: 14 days **Clinical features:** • Swelling and cyanosis of the face and wattles, discharge from the nostrils, mouth and eyes, laboured breathing and lack of coordination. Microscopic demonstration of myriad bacteria in blood smears, or impression smears of tissues such as liver or spleen. **Criteria for reporting:** Any positive laboratory test result: • Detection of agent: culture, PCR **References**: OIE. (2017). *Manual for Diagnostic Tests for Terrestrial Animals (the Terrestrial Manual*). World Organisation for Animal Health. Online Access <http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.03.09_FOWL_CHOLERA.pdf> Michigan Department of Natural Resources. (2017). *Fowl Cholera*. Online Access <http://www.michigan.gov/dnr/0,4570,7-153-10370_12150_12220-26650--,00.html>. The Poultry Site. (2014). *Fowl Cholera*. Online Access <http://www.thepoultrysite.com/publications/6/diseases-of-poultry/181/fowl-cholera/>.
59. Fowl pox	• **Pathogen**: Fowlpox virus of the genus *Avipoxvirus* of the family *Poxviridae* • **Susceptible species:** Mainly chickens and turkeys • **Route of transmission:** Infected skin lesions, aerosol, mosquitoes (mechanical vectors) • **Risk factors:** Mosquitoes, multi-age flocks, • **Incubation period**: 4 to 10 days **Clinical features:** • Cutaneous form (dry pox): Proliferative lesions and scabs on skin • Diphtheritic form (wet pox): Diphtheritic lesions in the upper parts of the digestive and respiratory tracts which may result in respiratory distress and death from suffocation. • Transient drop in egg production and reduced growth rate in young birds

	Criteria for reporting: Clinical suspicion AND/OR any positive detection of the antigen using the following methods • Detection of agent: virus isolation, PCR, histopathology **References**: OIE. (2017). *Manual for Diagnostic Tests for Terrestrial Animals (the Terrestrial Manual*). World Organisation for Animal Health. Online Access <http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.03.10_FOWLPOX.pdf> Merck Sharp & Dohme Corp. (2018). *Fowlpox. MSD Manual (Veterinary Manual).* Merck & Co. Online Access <www.msdvetmanual.com/poultry/fowlpox/fowlpox-in-chickens-and-turkeys> Merck Sharp & Dohme Corp. (2016). *Fowlpox in Chickens and Turkeys. Merck Manual (Veterinary Manual).* Merck & Co. Online Access <http://www.merckvetmanual.com/poultry/fowlpox/fowlpox-in-chickens-and-turkeys>.
60. Fowl typhoid (*Salmonella* Gallinarum)	• **Pathogen**: *Salmonella enterica* subsp. *enterica* serovar Gallinarum biovar Gallinarum. Fowl Typhoid (*Salmonella* Gallinarum) • **Susceptible species**: Chickens are natural hosts but other birds including turkey and quail may be affected • **Route of transmission:** Vertical transmission (in the reproductive tract) from infected hens to chicks. Horizontal transmission via the respiratory and faecal-oral route through contaminated feed, bedding, pests, water, housing, infected animals and people. It can be shed intermittently in faeces. Eggs are contaminated through transovarial contamination, trans-shell contamination and eggshell contamination. • **Risk factors:** Poor biosecurity, exposure to infected animals (including pests such as rodents), people and contaminated environment. • **Incubation period:** 4 to 6 days • **Location:** Central and South America, Africa and Asia. **Clinical features:** • Nonspecific signs e.g. depression, weakness, somnolence, anorexia, dropping wings, huddling, dehydration and ruffled wings. • Droppings can be white and viscous • In older birds, disease is subacute with lameness and joint swellings **Criteria for reporting:** Any positive laboratory test result using the following methods: • Detection of agent: culture, PCR **References**: OIE. (2017). *Manual for Diagnostic Tests for Terrestrial Animals (the Terrestrial Manual*). World Organisation for Animal Health. Online Access <http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.03.11_FOWL_TYPHOID.pdf>

	The Center for Food Security & Public Health. (2009). *Fowl Typhoid and Pullorum Disease,* Iowa State University. Online Access. <http://www.cfsph.iastate.edu/Factsheets/pdfs/fowl_typhoid.pdf>. Nazir, S., Kamil, S.A., Darzi, M.M., Mir, M.A., nazir, K. and Amare, A. (2012). Pathology of Spontaneously Occurring Salmonellosis in Commercial Broiler Chickens of Kashmir valley, *Journal of World's Poultry Research*, 2(4):63-69 <https://www.researchgate.net/figure/235897928_fig1_Figure-1-Broiler-bird-affected-with-fowl-typhoid-showing-bronze-discolouration-of-liver>.
61. Getah virus disease	• **Pathogen**: Getah virus • **Susceptible species:** Horses and pigs. • **Route of transmission**: insect vector especially members of the genera *Aedes* and *Culex*. Can also be transmitted via aerosols or by direct contact with nasal secretions. • **Incubation period**: 3 to 4 days (intranasal inoculation) • **Location**: Eurasia and Australasia **Clinical features:** • Fever, oedema that typically affects the, stiffness, swelling of the submandibular lymph nodes, mild abdominal pain, depression, mild icterus, scrotal oedema, urticarial rash. **Criteria for reporting:** Any positive laboratory test result using the following methods: • Detection of agent: culture, PCR • Detection of immune response: CFT, HI **References**: The Center for Food Security & Public Health. (2017). *Getah Virus Infection.* Iowa State University. Online Access. <http://www.cfsph.iastate.edu/Factsheets/pdfs/getah_virus.pdf>.
62. Haemorrhagic septicaemia	• **Pathogen**: *Pasteurella multocida* subsp. *multocida*, serotypes 6:B and 6:E • **Susceptible Species**: [Zoonotic] Cattle and water buffalo have been identified as the major reservoir hosts. Horses, mules, donkeys, camels, cats may also be infected. • **Route of transmission**: direct contact with infected animals, ingestion or inhalation of the causative organism, which originates in the nasopharynx of infected animals. • **Incubation period**: 90 days (active and latent carriers may occur) • **Location**: Africa, Asia and the Middle East. **Clinical features:** • Fever, dullness, reluctance to move, salivation, nasal discharge, oedematous swellings at the submandibular region **Criteria for reporting**: Any positive laboratory test result using the following methods: • Detection of agent: culture

	References: OIE. (2017*). Terrestrial Animal Health Code, (the Terrestrial Code*). World Organisation for Animal Health. Online Access <http://www.oie.int/index.php?id=169&L=0&htmfile=chapitre_hs_pasteurella_multocida.htm> OIE. (2017). *Manual for Diagnostic Tests for Terrestrial Animals (the Terrestrial Manual*). World Organisation for Animal Health. Online Access <http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.04.11_HAEMORRHAGIC_SEPTICAEMIA.pdf> OIE. (2013). *Technical Disease Card*. Online Access <http://www.oie.int/fileadmin/Home/eng/Animal_Health_in_the_World/docs/pdf/Disease_cards/HAEMORRHAGIC_SEPTICEMIA.pdf>.
63. Hantavirus disease	• **Pathogen**: Hantavirus • **Susceptible Species**: [Zoonotic] Can be found naturally in rodents and insectivores (shrews and moles). Infection found in cats, dogs, pigs, horses, cattle, and rabbits although there is little to no evidence that it causes illness. The disease in humans may manifest as haemorrhagic fever with renal syndrome or haemorrhagic pulmonary syndrome. • **Route of transmission:** Inhalation of aerosolised virus, ingestion or bites • **Risk factors:** Rodent infested areas, especially if enclosed. • **Incubation period:** 1 – 6 weeks in humans **Clinical features:** (in rodents and insectivores) • Not associated with overt disease. **Criteria for reporting:** Any positive laboratory test result using the following methods: • Detection of agent: PCR **References**: The Center for Food Security & Public Health. (2009). *Hantavirus*. Iowa State University. Online Access. <http://www.cfsph.iastate.edu/Factsheets/pdfs/hantavirus.pdf>.
64. Heartwater	• **Pathogen**: *Ehrlichia* (formerly *Cowdria*) *ruminantium* • **Susceptible species**: Wild and domestic ruminants including cattle, sheep, goats and water buffalo • **Route of transmission**: By ticks in the genus *Amblyomma*. • **Incubation period**: 2 to 3 weeks • **Location**: Africa, Madagascar and the Caribbean **Clinical features:** • Fever, anorexia, congested mucous membranes, diarrhoea • Respiratory signs: cough, dyspnoea • Neurological signs: tremors, aggressiveness, convulsions, opisthotonos, hyperaesthesia, nystagmus • Post-mortem findings:

	○ Hydropericardium, with straw-coloured to reddish pericardial fluid (more common in sheep and goats than in cattle) ○ Pulmonary oedema, hydrothorax, ascites, perirenal oedema, oedema of the mediastinal and bronchial lymph nodes **Criteria for reporting**: Any positive laboratory test result using the following methods: • Detection of agent: microscopic examination of stained smears, immunostaining, PCR **References**: The Center for Food Security & Public Health. (2015). *Heartwater*. Iowa State University. Online Access. <http://www.cfsph.iastate.edu/Factsheets/pdfs/heartwater.pdf> OIE. (2017*). Terrestrial Animal Health Code, (the Terrestrial Code*). World Organisation for Animal Health. Online Access < http://www.oie.int/index.php?id=169&L=0&htmfile=chapitre_heartwater.htm> OIE. (2017). *Manual for Diagnostic Tests for Terrestrial Animals (the Terrestrial Manual*). World Organisation for Animal Health. Online Access < http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.01.09_HEARTWATER.pdf> Stoltsz, *Heartwater Diagnosis and differential diagnosis.* Online Access <http://www.afrivip.org/sites/default/files/HW/diagnosis.html>
65. Horse mange	• **Pathogen**: *Sarcoptes scabiei* var *equi*, *Psoroptes ovis*, *Psoroptes cuniculi*, *Chorioptes bovis*, *Demodex equi* or *Demodex caballi*, Trombiculid mites and Forage mites. • **Susceptible species**: [Zoonotic] Horses, varies depending on louse species • **Route of transmission**: Mechanical transmission. • **Incubation period**: - **Clinical features:** • Intense pruritis, papules and vesicles that later develop into crusts. Alopecia and crusting which spreads and lichenification of the skin. May eventually cover the entire body. **Criteria for reporting:** Any detection of the organism by microscopic examination **References**: Merck Sharp & Dohme Corp. (2016). *Mange in Horses. MSD Manual (Veterinary Manual).* Merck & Co. Online Access <https://www.msdvetmanual.com/integumentary-system/mange/mange-in-horses>. petMD, 2017, Lice Infestation in Horses, <http://www.petmd.com/horse/conditions/skin/c_hr_lice>

66. Horse pox	• **Pathogen**: Horse poxvirus, of the genus *Orthopoxvirus* in the family Poxviridae. • **Susceptible Species**: Horses • **Route of transmission**: Direct contact with an infected host or via contaminated equipment, supplies and instruments. • **Incubation period**: 4 to 8 days **Clinical features:** • Multiple pox-like lesions in the oral cavity, eyelids or face ranging from papules, vesicles to pustules. • Inappetance, pyrexia • Papules on the flexor surface of the pastern region **Criteria for reporting:** Any positive laboratory test result using the following methods: • Detection of the agent: Visualisation of intracytoplasmic inclusion bodies in vacuolated keratinocytes, electron microscopy, VI • Detection of immune response **References**: Mair, T.S. and Scott, *Horsepox*. Bell Equine Veterinary Clinic. Online Access < www.bellequine.co.uk/downloads/169-171_eve_man_08-042_mair.pdf>
67. Infectious bovine rhinotracheitis (Infectious pustular vulvovaginitis)	• **Pathogen**: Bovine herpesvirus 1 (BoHV-1) • **Susceptible species**: Cattle • **Route of transmission**: Contact with an infected animal, respiratory and venereal route • **Incubation period**: 21 days **Clinical features:** • Upper respiratory tract: Serous to purulent ocular and nasal discharges, hyperaemia of the muzzle and conjunctivitis • Genital tract: pustular vulvovaginitis or balanoposthitis. • Reduced milk yield • Fever, abortion **Criteria for reporting**: Any positive laboratory test result using the following methods: • Detection of agent: VI, PCR, FAT • Detection of immune response **References**: OIE. (2017*). Terrestrial Animal Health Code, (the Terrestrial Code*). World Organisation for Animal Health. Online Access <http://www.oie.int/index.php?id=169&L=0&htmfile=chapitre_ibr_ipv.htm> OIE. (2017). *Manual for Diagnostic Tests for Terrestrial Animals (the Terrestrial Manual*). World Organisation for Animal Health. Online Access <http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.04.12_IBR_IPV.pdf>

	NADIS. (2018). Infectious Bovine Rhinotracheitis (IBR, BHV 1). Online Access. <http://www.nadis.org.uk/bulletins/ibr.aspx>
68. Infectious bursal disease (Gumboro disease)	• **Pathogen**: Infectious bursal disease (IBD) virus, of the genus *Avibirnavirus* and family *Birnaviridae*. • **Susceptible species**: Chicken, turkey, duck, guinea fowl and ostrich. • **Route of transmission:** Shed in faeces and transferred via fomites. The virus is very stable and difficult to eradicate • **Risk factors:** Non-vaccinated; or vaccinated strains do not closely match antigenic profiles of field viruses, introduction of new poultry or poor biosecurity practices • **Incubation period:** 7 days. **Clinical features:** • Poor feed efficiency, incoordination, diarrhoea • Swollen, oedematous, yellowish and occasionally haemorrhagic cloacal bursa • Post-mortem findings: muscular and proventricular haemorrhages, nephritis, bursal inflammation, bursal oedema or haemorrhages and bursal atrophy (depending on the stage of the disease). **Criteria for reporting:** Any positive laboratory test result using the following methods: • Detection of agent: VI, PCR, histopathology • Detection of immune response: AGID, VN, ELISA **References**: OIE. (2017*). Terrestrial Animal Health Code, (the Terrestrial Code*). World Organisation for Animal Health. Online Access <http://www.oie.int/index.php?id=169&L=0&htmfile=chapitre_gumboro_disease.htm> OIE. (2017). *Manual for Diagnostic Tests for Terrestrial Animals (the Terrestrial Manual*). World Organisation for Animal Health. Online Access <http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.03.12_IBD.pdf> Merck Sharp & Dohme Corp. (2016). *Overview of Infectious Bursal Disease in Poultry (Gumboro disease). MSD Manual (Veterinary Manual).* Merck & Co. Online Access <http://www.msdvetmanual.com/poultry/infectious-bursal-disease/overview-of-infectious-bursal-disease-in-poultry>. The Poultry Site. (2014). *Infectious Bursal Disease (Gumboro*). Online Access <http://www.thepoultrysite.com/publications/6/diseases-of-poultry/193/infectious-bursal-disease-gumboro/>.
69. Leishmaniosis	• **Pathogen:** *Leishmania* spp. Canine leishmaniosis is caused by *L. infantum* and *L. chagasi* (now synonymous with *L. infantum*) • **Susceptible Species:** [Zoonotic] Leishmaniosis affects a large range of domestic and wild animals, including dogs, rodents and humans

	• **Route of transmission**: By phlebotomine sand flies (genera *Phlebotomus* spp (Old World sand flies) and *Lutzomyia* spp (New World sand flies)), vertical transmission, blood transfusion • **Risk Factors:** Malnutrition, immunosuppression, environmental changes, climate change, blood transfusion • **Incubation period**: 3 months to 7 years • **Location**: Tropical and sub-tropical regions in Europe, Africa, Asia, the Middle East, Latin America and the Mediterranean region. **Clinical features:** • Cutaneous signs: non-pruritic exfoliative dermatitis, alopecia seen especially around the eyes, other skin lesions (popular dermatitis), ocular signs (blepharitis, conjunctivitis) • Visceral signs: lethargy, generalised lymph node enlargement (lymphadenomegaly), progressive weight loss, muscular atrophy, splenomegaly, polyuria, polydipsia, bleeding disorder (epistaxis, malena, hematuria), lameness, vomiting and diarrhoea. **Criteria for reporting:** Any positive laboratory test result using the following methods: • Detection of agent: cytology, histopathology, PCR • Detection of immune response: ELISA, IFA **References**: OIE. (2017). *Manual for Diagnostic Tests for Terrestrial Animals (the Terrestrial Manual*). World Organisation for Animal Health. Online Access <http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.01.11_LEISHMANIOSIS.pdf> The Center for Food Security & Public Health. (2009). *Leishmaniasis (Cutaneous and Visceral)*. Iowa State University. Online Access. <http://www.cfsph.iastate.edu/Factsheets/pdfs/leishmaniasis.pdf>. Global Health Vet. (2010). Working in Morocco- Recurring Leishmaniasis in a canine patient. Online Access <https://globalhealthvet.com/2010/10/05/working-in-morocco-recurring-leishmaniasis-in-a-canine-patient/>.
70. Leptospirosis	• **Pathogen**: *Leptospira* spp. • **Susceptible species:** [Zoonotic] Dogs, cattle, sheep, goats, horses and pigs. Rodents are considered to be the primary source of infection to human beings. • **Route of transmission**: *Leptospira* spp. are excreted in the urine of both acutely and chronically infected animals. *Leptospira* spp. can be transmitted directly between hosts (direct contact with the mucous membrane or abraded skin; bite from infected animal) or indirectly through the environment (ingestion of contaminated food or water; inhalation of aerosolized urine or water). • **Risk factors**: Exposure to water or soil contaminated by the bacteria; exposure to rodents and wild animals harbouring the bacteria; inhalation of droplets/aerosols of contaminated fluids. • **Incubation period**: 5 to 15 days in experimentally infected dogs.

	• **Location**: Found worldwide. **<u>Clinical features:</u>** • Acute or chronic renal failure, jaundice, haemoglobinuria, chronic active hepatitis, abortion, stillbirth, birth of weak offspring in dogs • Sudden onset of agalactiae, icterus and haemoglobinuria, reproductive losses in cattle and sheep • Reproductive losses, equine recurrent uveitis in horses **<u>Criteria for reporting</u>:** Clinical suspicion AND any positive laboratory test result using the following methods: • Detection of agent: culture, PCR, immunostaining • Detection of immune response: IDEXX SNAP test, MAT **References**: OIE. (2017). *Manual for Diagnostic Tests for Terrestrial Animals (the Terrestrial Manual*). World Organisation for Animal Health. Online Access <http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.01.12_LEPTO.pdf> The Center for Food Security & Public Health. (2013). *Leptospirosis*. Iowa State University. Online Access. <http://www.cfsph.iastate.edu/Factsheets/pdfs/leptospirosis.pdf>. World Health Organisation. (2013). *Leptospirosis*. Online Access <www.who.int/zoonoses/diseases/leptospirosis/en>
71. Listeriosis	• **Pathogen**: *Listeria monocytogenes* • **Susceptible Species**: [Zoonotic] Clinical listeriosis is mainly a ruminant disease (including cattle and goats). A wide variety of animal species such as pigs, horses, dogs, cats, birds, fish and crustaceans, can be infected. • **Route of transmission:** Ingestion of contaminated silage is the most frequent source of infection for livestock, however transmission is also possible via inhalation, direct contact and vertical transmission. The bacteria can be found in soil, water, effluents, a large variety of foods, and the faeces of infected humans and animals. • **Risk factors:** Contaminated feed • **Incubation period:** 10 days to 3 weeks in ruminants, however septicaemia and abortion may appear after one day or more. **<u>Clinical features:</u>** • Encephalitis: depression, loss of appetite, fever, lack of coordination, profuse salivation, facial paralysis, circling and unilateral neurological signs • Abortion late in gestation • Septicaemia in young animals. **<u>Criteria for reporting</u>:** Any positive laboratory test result using the following methods: • Detection of agent: culture

	References: The Center for Food Security & Public Health. (2005). *Listeriosis.* Iowa State University. Online Access. <http://www.cfsph.iastate.edu/Factsheets/pdfs/listeriosis.pdf>. Merck Sharp & Dohme Corp. (2016). *Overview of Listeriosis. Merck Manual (Veterinary Manual).* Merck & Co. Online Access <http://www.merckvetmanual.com/generalized-conditions/listeriosis/overview-of-listeriosis>
72. Lumpy skin disease	• **Pathogen**: Lumpy skin disease virus (LSDV) • **Susceptible species**: Cattle, water buffalo and certain wild ruminants. • **Route of transmission**: By arthropod vectors such as mosquitoes, biting flies, midges and ticks. • **Risk factors**: Import of infected animals from a country of origin/residence with a history of the disease and/or with a history of an outbreak of the disease. • **Incubation period**: 28 days • **Location**: Africa and the Middle East. **Clinical features:** • Pyrexia • Firm nodules and oedema on the skin, mucous membranes and internal organs. • Ulcers in the oral and nasal cavities resulting in nasal discharge and excessive salivation • Sterility in bulls, abortion in cows **Criteria for reporting**: Clinical suspicion AND/OR any positive laboratory test result using the following methods: • Detection of agent: VI, PCR, EM **References**: OIE. (2017*). Terrestrial Animal Health Code, (the Terrestrial Code*). World Organisation for Animal Health. Online Access <http://www.oie.int/index.php?id=169&L=0&htmfile=chapitre_lsd.htm> OIE. (2017). *Manual for Diagnostic Tests for Terrestrial Animals (the Terrestrial Manual*). World Organisation for Animal Health. Online Access <http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.04.13_LSD.pdf> The Center for Food Security & Public Health. (2017). *Lumpy Skin Disease*. Iowa State University. Online Access. <http://www.cfsph.iastate.edu/Factsheets/pdfs/lumpy_skin_disease.pdf> OIE. (2013). *Technical Disease Card*. Online Access <http://www.oie.int/fileadmin/Home/eng/Animal_Health_in_the_World/docs/pdf/Disease_cards/LUMPY_SKIN_DISEASE_FINAL.pdf> FAO. A070 – Lumpy Skin Disease. Online Access <http://lrd.spc.int/ext/Disease_Manual_Final/a070__lumpy_skin_disease.html>

73. Lyme disease	• **Pathogen**: *Borrelia burgdorferi* • **Susceptible species:** [Zoonotic] Lyme disease has been reported in dogs, horses and cattle. Serological evidence of infection has been seen in cats. • **Route of transmission**: Transmitted by *Ixodes* spp. (ticks); wild animals (e.g. small rodents, birds) serve as reservoir hosts. • **Risk factors**: Exposure to infected ticks in/from an endemic area • **Incubation period**: 2 to 5 months **Clinical features:** • Shifting lameness and polyarthritis, particularly of the carpal joints. • Fever, anorexia, kidney disease and neurological signs **Criteria for reporting:** Clinical suspicion AND any positive test result (screening and laboratory) using the following methods: • Positive C_6 ELISA (qualitative/ quantitative) **References**: The Center for Food Security & Public Health. (2011). *Lyme Disease*. Iowa State University. Online Access <http://www.cfsph.iastate.edu/Factsheets/pdfs/lyme_disease.pdf>.
74. Lymphocytic choriomeningitis	• **Pathoge**n: Lymphocytic choriomeningitis virus • **Susceptible species:** [Zoonotic] Primarily rodents (mice, hamsters, guinea pigs, chinchillas, rats) • **Route of Transmission:** Saliva, urine, faeces, milk, and semen of infected rodents. Introduced through broken skin, nose, eyes or mouth. Can be transmitted *in utero* during pregnancies. • **Incubation period:** 5 to 6 days in experimentally infected adult mice. **Clinical features:** • Growth retardation, weight loss, emaciation, ascites, glomerulonephritis, blepharitis, convulsions and photophobia in young mice. • Lethargy, anorexia, glomerulonephritis and chronic generalised vasculitis in hamsters. **Criteria for reporting:** Any positive laboratory test result using the following methods: • Detection of agent: VI, PCR • Detection of immune response **References**: The Center for Food Security & Public Health. (2010). *Lymphocytic Choriomeningitis.* Iowa State University. Online Access <http://www.cfsph.iastate.edu/Factsheets/pdfs/lymphocytic_choriomeningitis.pdf>. Schnell, F.J., Sundholm, S., Crumley, S., Iversen P. L. and Mourich, D.V. (2012). Lymphoyctic Choriomeningitis Virus Infection in FVB Mouse Produces Hemorrhagic Disease. Online Access

	<http://journals.plos.org/plospathogens/article?id=10.1371/journal.ppat.1003073>. CDC. (2014). Lymphocytic Choriomeningitis (LCM). Online Access <https://www.cdc.gov/vhf/lcm/symptoms/index.html>.
75. Maedi-visna	• **Pathogen**: Maedi-visna virus • **Susceptible species**: Sheep and goats. • **Route of transmission**: drinking infected colostrum or milk, spread during close contact via respiratory route. • **Incubation period**: more than two years. Sheep develop clinical signs when they are at least 3 to 4 years of age. • **Location**: Europe. **Clinical features:** • Wasting, dyspnoea, ataxia, incoordination, paresis and paraplegia • Chronic mastitis • Post mortem findings: emphysematous and mottled or uniformly discoloured with pale grey or brown areas of consolidation on lungs **Criteria for reporting**: Any positive laboratory test result using the following methods: • Detection of agent: VI, PCR • Detection of immune response: ELISA, AGID **References**: OIE. (2017). *Manual for Diagnostic Tests for Terrestrial Animals (the Terrestrial Manual*). World Organisation for Animal Health. Online Access <http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.07.02-03_CAE_MV.pdf> The Center for Food Security & Public Health. (2015). *Small Ruminant Lentiviruses*. Iowa State University. Online Access <http://www.cfsph.iastate.edu/Factsheets/pdfs/maedi_visna_and_caprine_arthritis_encephalitis.pdf>
76. Marek's disease	• **Pathogen**: Marek's Disease virus • **Susceptible species**: Domestic chickens, quails and turkeys • **Route of transmission:** Highly contagious and readily transmitted. Transmitted via fomites and inhalation of contaminated dust. Infected chickens can be carriers for long periods of time. Virus matures in the epithelium of the feather follicle. • **Risk factors:** Vaccination reduces, but does not prevent shedding of the infectious virus; introduction of new birds • **Incubation period:** Can occur at any time, beginning at 3 to 4 weeks of age or older **Clinical features:**

	• Acute form: visceral lymphomas in multiple organs, severe depression, brain pathology with vasogenic oedema resulting in transient paralysis, widespread and diffuse lymphomatous involvement of organs • Classical form: partial or complete paralysis of legs and wins, enlargement of peripheral nerves (vagus, brachial and sciatic plexuses), lymphomas as small, soft, grey tumours in ovaries and other organs **Criteria for reporting:** Clinical suspicion AND any positive laboratory test result using the following methods: • Detection of agent: histopathology, VI, PCR • Detection of immune response: AGID **References**: OIE. (2017). *Manual for Diagnostic Tests for Terrestrial Animals (the Terrestrial Manual*). World Organisation for Animal Health. Online Access <http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.03.13_MAREK_DIS.pdf> Boodhoo, N., Gurung, A., Sharif, S. and Behboudi, S. (2016). Marek's disease in chickens: a review with focus on immunology. Online Access <https://veterinaryresearch.biomedcentral.com/articles/10.1186/s13567-016-0404-3>. The Chicken Vet. (2017). Mareks Disease. Online Access <http://www.chickenvet.co.uk/health-and-common-diseases/mareks/index.aspx>.
77. Melioidosis	• **Pathogen**: *Burkholderia pseudomallei* • **Susceptible species**: [Zoonotic] Terrestrial and aquatic mammals, birds, reptiles and fish. • **Route of transmission**: Contact with contaminated soil or water through skin wounds, inhalation and ingestion • **Risk factors**: Rodents, tropical climates, exposure to soil and water bodies, predisposing medical conditions such as chronic renal disease, chronic lung disease, immunosuppressed • **Incubation period**: Varies; could be days to years • **Location**: Asia and northern Australia. **Clinical features:** • Chronic abscess formation and granuloma formation in subcutaneous tissues or internal organs • Localised respiratory signs, gastrointestinal signs, septic arthritis, osteomyelitis, mastitis, orchitis, neulogical signs, mycotic aneurysms may be seen. • Acute, fulminant septicaemia with resultant pneumonia and/or encephalomyelitis **Criteria for reporting:** Any positive laboratory test result using the following methods:

	• Detection of agent: culture, PCR **References**: Merck Sharp & Dohme Corp. (2016). *Overview of Melioidosis. MSD Manual (Veterinary Manual).* Merck & Co. Online Access <http://www.msdvetmanual.com/generalized-conditions/melioidosis/overview-of-melioidosis>. The Center for Food Security & Public Health. (2016). *Melioidosis*. Iowa State University. Online Access. <http://www.cfsph.iastate.edu/Factsheets/pdfs/meliodosis.pdf>
78. Menangle virus disease	• **Pathogen**: Menangle virus • **Susceptible species**: [Zoonotic] Fruit bats of the genus *Pteropus* have been identified as the reservoir hosts. Clinical signs have been reported in pigs. • **Route of transmission:** Transmission from flying-foxes to pigs is hypothesized to occur by the faecal-oral route. Transmission between pigs is by faecal-oral route. • **Incubation period:** 2 to 3 days in experimentally infected pigs. • **Location:** Australia **Clinical features:** • Reproductive failure and congenital defects in pigs. • Reduced conception rates, reduced farrowing rates • Reduced litter size in 45% of sows • Delivery at term of a large number of mummified and stillborn foetuses including some with severe skeletal and craniofacial defects **Criteria for reporting:** Any positive laboratory test result using the following methods: • Detection of agent: VI • Detection of immune response: VN **References**: The Center for Food Security & Public Health. (2017). *Menangle Virus Infection*. Iowa State University. Online Access. <http://www.cfsph.iastate.edu/Factsheets/pdfs/menangle.pdf>. Wildlife Health Australia. (2017). Online Access <https://www.wildlifehealthaustralia.com.au/>
79. Murray Valley encephalitis	• **Pathogen**: Murray Valley encephalitis virus, a *Flavivirus*. • **Susceptible species:** [Zoonotic] Horses. Primary hosts: water birds such as herons and egrets which acts as reservoirs or amplifiers for infection. Other possible hosts: domestic fowls and wild birds • **Route of Transmission:** Bites from infected mosquito vectors (*Culex* Species and some *Aedes* species) • **Incubation period:** 1 to 4 weeks in humans • **Location:** Australia **Clinical features:**

	• Fever, depression, neurological signs such as incoordination and inappetance **<u>Criteria of reporting</u>:** Any positive laboratory test result using the following methods: • Detection of agent: VI, PCR • Detection of immune response **References**: Knox. J., Cowan, R. U., Doyle, J.S., Ligtermoet, M.K., Archer, J.S., Burrow, J.N.C., Tong, S.Y.C., Currie, B.J., Mackenzie, J.S., Smith, D.W., Catton, M. Moran, R.J., Aboltins, C.A. and Richards, J.S. (2012). Murray valley encephalitis: a review of clnical features, diagnosis and treatment. Online Access <https://www.mja.com.au/journal/2012/196/5/murray-valley-encephalitis-review-clinical-features-diagnosis-and-treatment> National Library of Australia Australian Government Web Archive . (2004). Murray Valley encephalitis virus infection – Fact Sheet. Online Access <Webarchive.nla.gov.au/ov/20090918040505/http://www.health.gov.au/internet/main/publishing.nsf/Content/health-arbovirus-pdf-fsmurrayvalley.htm>
80. Myxomatosis	• **Pathogen**: Myxoma virus (MYXV) • **Susceptible species:** Myxomatosis only affects the species in the family Lagomorpha (rabbits, hares and pikas). • **Route of transmission**: Fleas and mosquito vectors via biting of naïve lagomorphs, direct animal to animal contact, or contact with fomites. • **Risk factors**: Myxomatosis causes a mild disease in its original host native to South America. However, may cause severe disease with high mortality in rabbits elsewhere. • **Incubation period**: 5 to 14 days • **Location**: Europe. **<u>Clinical features:</u>** • Subcutaneous masses, swelling and oedema of the eyelids and genitals, ocular discharge, pyrexia, lethargy, depression, and anorexia. • Sudden death **<u>Criteria for reporting</u>**: Any positive laboratory test result using the following methods: • Detecting the agent: PCR, virus isolation, histopathology, immunostaining • Detecting the immune response: ELISA **References**: OIE. (2018). General Disease Information Sheets. Online Access <http://www.oie.int/doc/ged/D13971.PDF>. OIE. (2017). *Manual for Diagnostic Tests for Terrestrial Animals (the Terrestrial Manual*). World Organisation for Animal Health. Online Access

	<http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.06.01_MYXO.pdf>
81. Nairobi sheep disease	• **Pathogen**: Nairobi sheep disease virus (NSDV) • **Susceptible species**: [Zoonotic] Sheep and goats. • **Route of transmission**: Tick (*Rhipicephalus* spp. Primarily *R. appendiculatus*) • **Incubation period**: 2 to 5 days • **Location**: East and Central Africa **Clinical features:** • Mortality rate ranging between 40 – 90 % • Sudden death • Fever, hyperventilation, severe depression, anorexia, disinclination to move, standing with a lowered head, conjunctivitis and sero-sanguinous nasal discharge • Acute haemorrhagic gastroenteritis • Abortion **Criteria for reporting**: Any positive laboratory test result using the following methods: • Detecting the agent: PCR, virus isolation • Detecting the immune response: CFT, IFA **References**: OIE. (2017). *Manual for Diagnostic Tests for Terrestrial Animals (the Terrestrial Manual*). World Organisation for Animal Health. Online Access <http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.09.01_BUNYAVIRAL_DISEASES.pdf> The Center for Food Security & Public Health. (2016). *Nairobi Sheep Disease*. Iowa State University. Online Access. <http://www.cfsph.iastate.edu/Factsheets/pdfs/nairobi_sheep_disease.pdf>
82. New World screwworm (*Cochliomyia hominivora)*	• **Pathogen**: Larvae of *Cochliomyia hominivorax* • **Susceptible species**: [Zoonotic] All living warm-blooded animals can be infested by screwworm but they are rare in birds • **Route of transmission:** Adult female screwworms lay eggs at the borders of wounds on living, injured mammals or at the edge of body orifices. • **Risk factors:** Presence of wounds. • **Incubation period:** The period of time between ovisposition at a wound site and the expression of disease due to burrowing larvae can be as short as 1 to 2 days. **Clinical features:** • Presence of discharge and the emission of a pungent odour from wounds. • Wounds often experience bacterial infection and may enlarge to 3cm or more in width to as much as 20cm in depth. • Affected animals may appear unwell, have poor appetite, or depressed; milk production may be reduced.

	• Severe infestations can be fatal **<u>Criteria for reporting</u>:** Confirmation by an entomologist**:** • Identification of larval specimens preserved in ethanol under dissecting microscope at up to x50 magnification (ref OIE Terrestrial Manual for illustrated descriptions of the parasite) **References**: OIE. (2017). *Manual for Diagnostic Tests for Terrestrial Animals (the Terrestrial Manual*). World Organisation for Animal Health. Online Access <http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.01.13_SCREWW.pdf> The Center for Food Security & Public Health. (2016). *Screwworm Myiasis*. Iowa State University. Online Access. <http://www.cfsph.iastate.edu/Factsheets/pdfs/screwworm_myiasis.pdf> Animal Health Australia. (2017). Screw Worm Fly Surveillance & Preparedness. Online Access <https://www.animalhealthaustralia.com.au/what-we-do/disease-surveillance/screw-worm-fly/>. DAWR. (2017). Screw-worm fly. Online Access <www.agriculture.gov.au/biosecurity/australia/naqs/naqs-target-lists/screw-worm-fly> OIE. (2013). *Technical Disease Card*. Online Access <www.oie.int/fileadmin/Home/eng/Animal_Health_in_the_world/docs/pdf/Disease_cards/SCREWWORM.pdf>.
83. Newcastle disease	• **Pathogen:** Newcastle disease virus (NDV), an a*vian paramyxovirus serotype 1 (PMV-1)* • **Susceptible species:** [Zoonotic] Both domestic and wild bird species • **Route of Transmission:** Direct contact with secretions and excretions of infected birds, fomites, such as contaminated food and water, equipment or environment. • **Risk factors**: contact with wild infected birds, import of infected animals from a country of origin/residence with a history of the disease and/or with a history of an outbreak of the disease. • **Incubation period:** 21 days • **Location:** Asia, Africa, the Middle East, Central and South America. **<u>Clinical features:</u>** • Diarrhoea • Respiratory signs: coughing, sneezing, dyspnoea, inflammation and discolouration of the head • Neurological signs: tremors and paralysis • Drop in egg production and egg quality (soft shells, unexpected shell colour, shell-less eggs) • Increased mortality

	Criteria of reporting: Clinical suspicion AND/OR any positive laboratory test result using the following methods: • Detecting the agent: virus isolation, PCR • Detecting the immune response: HI, ELISA **References**: OIE. (2017*). Terrestrial Animal Health Code, (the Terrestrial Code*). World Organisation for Animal Health. Online Access < http://www.oie.int/index.php?id=169&L=0&htmfile=chapitre_nd.htm> OIE. (2017). *Manual for Diagnostic Tests for Terrestrial Animals (the Terrestrial Manual*). World Organisation for Animal Health. Online Access < http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.03.14_NEWCASTLE_DIS.pdf> OIE. (2013). *Technical Disease Card*. Online Access <http://www.oie.int/fileadmin/Home/eng/Animal_Health_in_the_World/docs/pdf/Disease_cards/NEWCASTLE_DISEASE.pdf>. Cornell University, *Atlas of Avian Diseases*, <http://www.poultrydisease.ir/Atlases/avian-atlas/search/lesion/645.html>.
84. Old World screwworm (*Chrysomya bezziana*)	• **Pathogen**: Larvae of *Chrysomya bezziana* • **Susceptible Species**: [Zoonotic] All living warm-blooded animals can be infested by screwworm but they are most common in mammals while rare in birds • **Route of transmission**: Adult female screwworms lay eggs at the borders of wounds on living, injured mammals or at the edge of body orifices (they do not oviposit on carrion). • **Risk factors**: Presence of wounds. • **Incubation period**: The period of time between ovisposition at a wound site and the expression of disease due to burrowing larvae can be as short as 1 to 2 days. • **Location**: Africa and South Asia. **Clinical features:** • Presence of discharge and the emission of a pungent odour from wounds. • Wounds often experience bacterial infection and may enlarge to 3cm or more in width to as much as 20cm in depth. • Affected animals may appear unwell, have poor appetite, or depressed; milk production may be reduced. • Severe infestations can be fatal **Criteria for reporting:** Confirmation by an entomologist**:** • Identification of larval specimens preserved in ethanol under dissecting microscope at up to x50 magnification (ref OIE Terrestrial Manual for illustrated descriptions of the parasite) **References**: OIE. (2017). *Manual for Diagnostic Tests for Terrestrial Animals (the Terrestrial Manual*). World Organisation for Animal Health. Online Access

	<http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.01.13_SCREWW.pdf> The Center for Food Security & Public Health. (2016). *Screwworm Myiasis*. Iowa State University. Online Access. <http://www.cfsph.iastate.edu/Factsheets/pdfs/screwworm_myiasis.pdf> FAO. B060 Screw-worm fly. Online Access <http://lrd.spc.int/ext/Disease_Manual_Final/b060__screwworm_fly.html OIE. (2013). *Technical Disease Card*. Online Access <www.oie.int/fileadmin/Home/eng/Animal_Health_in_the_world/docs/pdf/Disease_cards/SCREWWORM.pdf>.
85. Ovine pulmonary adenocarcinoma (Ovine pulmonary adenomatosis)	• **Pathogen**: Jaagsiekte sheep retrovirus (JSRV), also known as pumonary adenomatosis virus, a member of the genus Betaretrovirus in the family Retroviridae • **Susceptible species**: Sheep • **Route of transmission**: Respiratory route by aerosols or droplets derived from respiratory exudates of infected sheep. • **Incubation period**: 6 months to 3 years • **Location:** Europe, Asia, Africa and the Americas **Clinical features:** • Progressive emaciation, weight loss and respiratory disease • If the head is lowered, copious frothy exudate pour from the nares (using the "wheelbarrow test" – raising the hind legs to lower the head of the animal) • Post-mortem findings: o Enlarged lungs which may not collapse upon opening of the thoracic cavity (in severe cases) o Frothy fluid found in the trachea and bronchi o Tumours are solid and found in the lungs (in the apical, cardiac and ventral portions of the diaphragmatic lobes), which on cut surface, are glistening with a shiny translucent sheen and granular **Criteria for reporting**: Clinical suspicion AND/OR any positive laboratory test result using the following methods: • Detecting the agent: PCR, histopathology **References** OIE. (2017). *Manual for Diagnostic Tests for Terrestrial Animals (the Terrestrial Manual*). World Organisation for Animal Health. Online Access <http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.07.09_OPA.pdf> The Center for Food Security & Public Health. (2009). *Ovine Pulmonary Adenocarcinoma*. Iowa State University. Online Access. <http://www.cfsph.iastate.edu/Factsheets/pdfs/ovine_pulmonary_adenomatosis.pdf>

	Moredun Foundation. (2017). OPA (Jaagsiekte). Online Access <http://www.moredun.org.uk/research/research-%40-moredun/respiratory-diseases/opa>
86. Paratuberculosis	• **Pathogen**: *Mycobacterium avium* subsp. *paratuberculosis* • **Susceptible species**: Ruminants (primarily sheep and cattle). • **Route of transmission:** Direct (Transplacental; ingestion of infected materials such as raw milk from infected cows) or indirect (exposure to viable bacteria in a faeces-contaminated environment such as pasture and feed). • **Risk factors:** Exposure to asymptomatic/subclinical carriers through herd expansion or replacement animals. • **Incubation period:** Weeks to years (chronic) **Clinical features:** • Diarrhoea, ill-thrift, progressive weight-loss despite a good appetite and normal body temperature, "bottle jaw" • Post-mortem findings: thickening and corrugation of intestinal mucosa; enlarged and oedematous mesenteric lymph nodes **Criteria for reporting:** Any positive laboratory test result using the following methods: • Detecting the agent: PCR, culture • Detecting the immune response: CFT, ELISA **References**: OIE. (2017). *Manual for Diagnostic Tests for Terrestrial Animals (the Terrestrial Manual*). World Organisation for Animal Health. Online Access <http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.01.15_PARATB.pdf> OIE. (2018). *General Disease Information Sheets*. Online Access <http://www.oie.int/fileadmin/Home/eng/Media_Center/docs/pdf/Disease_cards/PARATUBERCULOSIS-EN.pdf> The Center for Food Security & Public Health. (2007). *Paratuberculosis*. Iowa State University. Online Access <http://www.cfsph.iastate.edu/Factsheets/pdfs/paratuberculosis.pdf>. Johne's Information Center. (2010). FAQs. Online Access <http://www.johnes.org/goats/faqs.html>. NADIS. (2018). Johne's Disease (Paratuberculoisis). Online Access <www.nadis.org.uk/bulletins/johnes-disease-paratuberculosis.aspx>
87. Porcine brucellosis	• **Pathogen**: *Brucella suis* • **Susceptible species**: [Zoonotic] *B. suis* can potentially affect a range of mammals, including humans, depending on the biovars. Biovars 1, 2 and 3 are found in pigs, while biovar 4 is found in caribou and reindeer. European hares are also a reservoir for biovar 2. Biovar 5 is found in rodents. • **Route of transmission**: Ingestion of contaminated feed, of birth or abortion products, aborted foetuses and membranes or by inhalation or via broken skin.

	• **Risk factors:** Breeding pigs (imported or local) and contaminated feed (imported or contamination from infected pigs) • **Incubation period**: Variable **Clinical features:** • In sows, signs include unexplained infertility and abortion at any stage of gestation, retained placenta, and birth of dead or weak piglets. • In boars, signs include orchitis and epididymitis. • Rarely arthritis, with excretion of organism in milk and uterine discharges **Criteria for reporting:** Any positive laboratory test result using the following methods: • Detecting the agent: PCR, culture, microscopic examination of stained smears • Detecting the immune response: CFT, ELISA, FPA **References**: OIE. (2017*). Terrestrial Animal Health Code, (the Terrestrial Code*). World Organisation for Animal Health. Online Access < http://www.oie.int/index.php?id=169&L=0&htmfile=chapitre_bovine_brucellosis.htm> OIE. (2017). *Manual for Diagnostic Tests for Terrestrial Animals (the Terrestrial Manual*). World Organisation for Animal Health. Online Access < http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.01.04_BRUCELLOSIS.pdf> The Center for Food Security & Public Health. (2009). *Porcine and Rangiferine Brucellosis: Brucella suis*. Iowa State University. Online Access. <http://www.cfsph.iastate.edu/Factsheets/pdfs/brucellosis_suis.pdf>
88. Psittacosis (ornithosis)	• **Pathoge**n: *Chlamydophila psittaci* (infection is also known as Avian Chlamydiosis) • **Susceptible species:** Most species of pet birds, poultry (domestic fowl, turkeys, ducks, geese and closely related domestic species) and wild birds • **Route of Transmission**: [Zoonotic]. Direct contact with aerosolised respiratory discharges and faeces of infected birds. Vertical transmission seen in chickens, ducks, parakeets, seagulls and snow geese. Transmission though fomites like contaminated feed and equipment is possible. • **Incubation period:** 3 days to several weeks in birds. • **Location:** Europe, Asia and Australia. **Clinical features**: • Conjunctivitis, anorexia, weight loss, diarrhoea with green to yellowish droppings, sinusitis, biliverdinuria, nasal discharge, sneezing, lachrymation and respiratory distress. • Post-mortem findings: multifocal hepatic necrosis, splenomegaly, hepatomegaly, fibrinous air sacculitis, pericarditis and peritonitis.

	Criteria of reporting: Any positive laboratory test result using the following methods: • Detecting the agent: culture (NOTE: hazard to laboratory workers), stained smears, IFA, PCR • Detecting the immune response **References**: OIE. (2017). *Manual for Diagnostic Tests for Terrestrial Animals (the Terrestrial Manual*). World Organisation for Animal Health. Online Access <http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.03.01_AVIAN_CHLAMYD.pdf> The Center for Food Security & Public Health. (2013). *Psittacosis Avian Chlamydiosis*. Iowa State University. Online Access <http://www.cfsph.iastate.edu/FastFacts/pdfs/psittacosis_F.pdf>. Cockatoo-info.com, *Psittacosis in cockatoos*. Online Access <http://cockatoo-info.com/health/chlamydia-psittacosis/>. Long Beach Animal Hospital. (2017). *Parrot Fever (Psittacosis*). Online Access <http://www.lbah.com/word/avian/parrot-fever-psittacosis/>
89. Pullorum disease	• **Pathogen**: *Salmonella enterica* subspecies *enterica* serovar Gallinarum biovar Pullorum (*Salmonella* Pullorum) • **Susceptible species**: Chickens are natural hosts but other birds can be affected • **Route of transmission:** Vertical transmission (in the reproductive tract) from infected hens to chicks. Horizontal transmission via contaminated feed, bedding, pests, water, housing, infected animals and people. It can be shed intermittently in faeces. Eggs are contaminated through through transovarial contamination, trans-shell contamination and eggshell contamination. • **Risk factors:** Poor biosecurity, exposure to infected animals (including pests such as rodents), people and contaminated environment. • **Incubation period:** 4 to 6 days • **Location:** Central and South America, Africa and Asia. **Clinical features:** • Decreased egg production, poor hatchability and increased mortality of young chicks may occur. • Depression, weakness, somnolence, loss of appetite, dropping wings, huddling, dehydration, ruffled feathers, laboured breathing or gasping, diarrhoea and pasting of the vent feathers in chicks and poults. **Criteria for reporting:** Any positive laboratory test result using the following methods: • Detecting the agent: culture, PCR • Detecting the immune response: agglutination test

	References: Merck Sharp & Dohme Corp. (2016). *Pullorum Disease in Poultry. MSD Manual (Veterinary Manual).* Merck & Co. Online Access <http://www.msdvetmanual.com/poultry/salmonelloses/pullorum-disease-in-poultry>. Shivaprased, H.L. (2000). Fowl typhoid and pullorum disease, Rev. Sci. tech. 19 (2), 405-424 <http://www.oie.int/doc/ged/D9308.PDF>. OIE. (2017). *Manual for Diagnostic Tests for Terrestrial Animals (the Terrestrial Manual*). World Organisation for Animal Health. Online Access <http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.03.11_FOWL_TYPHOID.pdf>
90. Q fever	• **Pathogen**: *Coxiella burnetii* • **Susceptible species**: [Zoonotic] Disease affects mostly humans, cattle, sheep and goats, but cats, dogs, rabbits, birds have been reported to be implicated in disease/infection. • **Route of transmission:** Through contact with infected animals, their reproductive tissues/materials or other animal products like wool. Infected animals shed bacteria in various secretions and excreta. • **Risk factors:** Close contact with infected animals, subclinical carriers (sheep, goats, cows) and animal products (i.e. abattoirs) • **Incubation period:** Variable. **Clinical features** • Late abortion and reproductive disorders such as immature, dead or weak offspring. **Criteria for reporting**: Any positive laboratory test result using the following methods: • Detecting the agent: culture, PCR, staining • Detecting the immune response: ELISA, CFT **References**: OIE. (2017). *Manual for Diagnostic Tests for Terrestrial Animals (the Terrestrial Manual*). World Organisation for Animal Health. Online Access <http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.01.16_Q_FEVER.pdf> The Center for Food Security & Public Health. (2007). *Q Fever*. Iowa State University. Online Access. <http://www.cfsph.iastate.edu/Factsheets/pdfs/q_fever.pdf>. Colorado State University. (2012). Biosecurity for Livestock Shows and Fairs. Online Access <http://coloradodisasterhelp.colostate.edu/prefair/disease/dz/Q%20fever.html>.

91. Rabbit haemorrhagic disease	• **Pathogen**: Rabbit haemorrhagic disease virus • **Susceptible species:** rabbits • **Route of transmission**: Direct contact with infected animals through the oral, nasal or conjunctival routes, indirect contact via exposure to an infected carcass, rabbit hair or fomites (including contaminated food, bedding and water), mechanical transmission via flies and other insect vectors. Other transmission routes include importation and subsequent exposure to infected rabbit meat. • **Risk factors**: History of residence in or travel to a country/region with endemic RHD. • **Incubation period**: 1 to 3 days for classical disease and death within 12 – 36 hours after onset of fever. Slightly longer (3 to 9 days) for RHDV2 • **Location**: Africa, the Americas, Asia, Europe and Oceania. **Clinical features:** • Fever, obtundation, lethargy, anorexia, tachypnoea, cyanosis, abdominal distension, constipation or diarrhoea and may progress to end stage clinical signs such as hypothermia, recumbency with or without seizures or epistaxis • Sudden death • Post-mortem findings: hepatic necrosis and haemorrhages. **Criteria for reporting:** Any positive laboratory test result using the following methods: • Detecting the agent: microscopy, PCR, immunostaining **References**: OIE. (2013). *Technical Disease Card*. Online Access <http://www.oie.int/fileadmin/Home/eng/Animal_Health_in_the_World/docs/pdf/Disease_cards/RHD.pdf>. OIE. (2017). *Manual for Diagnostic Tests for Terrestrial Animals (the Terrestrial Manual*). World Organisation for Animal Health. Online Access <http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.06.02_RHD.pdf>
92. Rift Valley fever	• **Pathogen**: Rift Valley Fever virus. • **Susceptible species**: [Zoonotic] Cattle, sheep, goats and wild ruminants. • **Route of transmission:** Transmitted primarily by mosquitoes. Transmission also possible through handling or consumption of raw infected meat, milk and animals (including exposure to discharges, blood, and post-abortion vaginal secretions). • **Risk factors:** Wild ruminants, presence of the mosquito vector. • **Incubation period:** Highly variable in animals, though can be as short as 12-36 hours; 2 – 6 days in humans. • **Location:** Africa **Clinical features:**

	• Pyrexia, hypersalivation, mucopurulent nasal discharge, diarrhoea, icterus • Abortion, weak offspring • Sudden death **<u>Criteria for reporting:</u>** Any positive laboratory test result using the following methods: • Detecting the agent: VI, PCR • Detecting the immune response: VN, ELISA **References**: OIE. (2017). *Manual for Diagnostic Tests for Terrestrial Animals (the Terrestrial Manual*). World Organisation for Animal Health. Online Access <http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.01.18_RVF.pdf> OIE. (2009). *Technical Disease Card*. Online Access <http://www.oie.int/fileadmin/Home/eng/Animal_Health_in_the_World/docs/pdf/Disease_cards/RIFT_VALLEY_FEVER.pdf>. FAO. (2017). Signs of Rift Valley Fever. Online Access <http://www.fao.org/docrep/006/y4611e/y4611e05.htm>. Texas A&M University. (2006). Rift Valley Fever. Online Access <http://www.cvm.tamu.edu/fadr/disease.aspx?DID=2900>.
93. Salmonellosis caused by *S.* Abortusovis	• **Pathogen**: *Salmonella enterica* subspecies *enterica* serovar Abortusovis (*Salmonella* Abortusovis) • **Susceptible species**: Sheep • **Route of transmission**: Ingestion of bacteria in vaginal discharges, placenta, aborted fetuses and infected new-borns, or respiratory secretions • **Incubation period**: 20 days (in late pregnancy) to 2 months (early pregnancy) • **Location:** Europe, Asia, the Middle East, Africa and South America. **<u>Clinical features:</u>** • Abortion during the last 4 to 6 weeks of gestation. • Weak lambs, stillborn • Fever and depression before aborting **<u>Criteria for reporting</u>**: Any positive laboratory test result using the following methods: • Detecting the agent: culture, PCR • Detecting the immune response: SAT, ELISA **Reference:** The Center for Food Security & Public Health. (2017). *Salmonella Abortusovis*. Iowa State University. Online Access. <http://www.cfsph.iastate.edu/Factsheets/pdfs/salmonella_abortusovis.pdf>

	OIE. (2017). *Manual for Diagnostic Tests for Terrestrial Animals (the Terrestrial Manual*). World Organisation for Animal Health. Online Access <http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.09.08_SALMONELLOSIS.pdf>
94. Scrapie	• **Pathogen**: Transmissable spongiform encephalopathies (TSE) caused by prions (PrPSc) • **Susceptible species**: Sheep and goats • **Route of transmission**: From dam to offspring during parturition to weaning, and potentially in utero, contact with fetal membranes and ingestion of milk from affected animals. • **Incubation period**: 2 to 7 years **Clinical features:** • Behavioural abnormalities including pruritus (compulsive rubbing or scraping against fixed objects, nibbling at skin, scratching, extensive wool loss • separation from the flock • Incoordination • Poor body condition **Criteria for reporting**: Clinical suspicion AND/OR any positive laboratory test result using the following methods: • Detection of the agent: Western immunoblot, Immunohistochemistry, Histopathology to detect vacuolar lesions on the medulla oblongata taken at the level of the obex (for classical scrapie) and cerebellum, thalamus and basal ganglia (for atypical scrapie) **References:** OIE. (2017*). Terrestrial Animal Health Code, (the Terrestrial Code*). World Organisation for Animal Health. Online Access <http://www.oie.int/index.php?id=169&L=0&htmfile=chapitre_scrapie.htm> OIE. (2017). *Manual for Diagnostic Tests for Terrestrial Animals (the Terrestrial Manual*). World Organisation for Animal Health. Online Access <http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.07.12_SCRAPIE.pdf> The Center for Food Security & Public Health. (2016). *Scrapie*. Iowa State University. Online Access <http://www.cfsph.iastate.edu/Factsheets/pdfs/scrapie.pdf>
95. Sendai virus infection	• **Pathoge**n: Paramyxovirus in the genus *Respirovirus* • **Susceptible species:** Mice, rats, hamsters and guinea pigs and pigs • **Route of Transmission:** Aerosol and contact with respiratory secretions • **Incubation period:** 1 to 12 days • **Location:** Japan **Clinical features:**

	• Pneumonia, dyspnoea, chattering teeth, wasting syndrome and death in young mice. **<u>Criteria for reporting:</u>** Any positive laboratory test result using the following methods: • Detecting the agent: PCR • Detecting the immune response: ELISA, IFA **References**: Charles River Laboratories International. (2009). Sendai Virus. Access online. <http://www.criver.com/files/pdfs/infectious-agents/rm_ld_r_sendai_virus.aspx>. The Center for Food Security & Public Health. (2015). *Sendai Virus*. Iowa State University. Online Access. <http://www.cfsph.iastate.edu/Factsheets/pdfs/shic-factsheet-sendai-virus.pdf>
96. Sheep pox/goat pox	• **Pathogen**: Sheep pox virus (SPPV) and goat pox virus (GTPV) • **Susceptible species**: Sheep and goats • **Route of transmission**: Contact with infected animals through abraded skin, inhalation, indirectly through fomites and mechanical transmission by biting arthropods • **Incubation period**: 21 days. • **Location**: North and central Africa, the Middle East and Asia. **<u>Clinical features:</u>** • Disseminated cutaneous nodules, papules, vesicles, pustules on the skin, particularly around eyes and mouth • Respiratory distress due to pulmonary lesions • Rhinitis, conjunctivitis and enlargement of superficial lymph nodes (in particular the prescapular lymph nodes) • Up to 100% mortality in fully susceptible breeds of sheep and goats **<u>Criteria for reporting</u>**: Clinical suspicion AND/OR any positive laboratory test result using the following methods: • Detection of the agent: VI, PCR, ELISA • Detection of immune response: Virus Neutralisation, IFAT **References:** OIE. (2017*). Terrestrial Animal Health Code, (the Terrestrial Code*). World Organisation for Animal Health. Online Access <http://www.oie.int/index.php?id=169&L=0&htmfile=chapitre_sheep_pox_goat_pox.htm> OIE. (2017). *Manual for Diagnostic Tests for Terrestrial Animals (the Terrestrial Manual*). World Organisation for Animal Health. Online Access <http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.07.13_S_POX_G_POX.pdf >

	The Center for Food Security & Public Health. (2017). *Sheep pox and goat pox*. Iowa State University. Online Access. <http://www.cfsph.iastate.edu/Factsheets/pdfs/sheep_and_goat_pox.pdf> OIE. (2013). *Technical Disease Card*. Online Access <http://www.oie.int/fileadmin/Home/eng/Animal_Health_in_the_World/docs/pdf/Disease_cards/SHEEP_GOAT_POX.pdf>.
97. Simian B Herpes Virus	• **Pathogen**: Herpes Simplex Virus • **Susceptible species**: Macaques, old world species such as colobus, patas and De Brazza's Monkeys. Endemic in captive and wild populations with a prevalence of infection that reaches 70-90% • **Route of Transmission**: Oral, ocular or genital contact of mucous membranes or open skin lesions • **Incubation period**: 3 to 7 days **Clinical features:** • Acute ascending encephalomyelitis resulting in death or neurological impairment (such as hyperesthesia, ataxia, diplopia, agitation and ascending flaccid paralysis) **Criteria for reporting**: Any positive laboratory test result using the following methods: • Detection of immune response **References**: National Organization for Rare Disorders, Inc. Simian B Virus Infection. Online Access. <https://rarediseases.org/rare-diseases/simian-b-virus-infection/> OIE. (2017). *Manual for Diagnostic Tests for Terrestrial Animals (the Terrestrial Manual*). World Organisation for Animal Health. Online Access <http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.09.11_NONHUMAN_PRIMATES.pdf> Elmore, D. and Eberle, R. (2008). Monkey B Virus. Comparative Medicine, 58 (1), 11 - 22
98. Surra	• **Pathogen**: *Trypanosoma evansi* • **Susceptible species**: Cattle, horses, buffaloes and camels. Can also affect dogs, cats, pigs, sheep and goats. • **Route of transmission:** Mechanical transmission by hematophagus flies, including Tabanids, stable flies and *Musca* spp; or ingestion of meat/milk of infected animals • **Risk factors:** Presence of hematophagus flies • **Incubation period**: 1 week to 2 months in horses • **Location**: Africa, Asia, and Central and South America. **Clinical features:** • Irregular fever, progressive weight loss despite good appetite, anaemia, enlargement of lymph nodes and dependent oedema

	Criteria for reporting: Any positive laboratory test result using the following methods: • Detecting the agent: Detection of Trypanosome parasite using wet blood films or stained thick and thin blood smears with Giemsa • Detecting the immune response: card agglutination, ELISA **References**: OIE. (2013). *Technical Disease Card*. Online Access <http://www.oie.int/fileadmin/Home/eng/Animal_Health_in_the_World/docs/pdf/Disease_cards/TRYPANO_EVANSI.pdf>. Desquesnes, M., Holzmuller, P, Lai, D., Dargantes, A., Lun, A. and Jittaplapong, S. (2013). Trypanosoma evansi and surra: a review and perspectives on origin, history, distribution, taxonomy, morphology, hosts, and pathogenic effects, BioMed Research International. Online Access <https://www.researchgate.net/figure/256491852_fig5_Chronic-up-and-acute-down-evolution-of-surra-in-horses-M-Desquesnes>. Dairy Knowledge Portal. Trypanosomiasis (Surra). Online Access <http://dairyknowledge.in/article/trypanosomiasis-surra>.
99. Swine erysipelas	• **Pathogen**: *Erysipelothrix rhusiopathiae* • **Susceptible species:** [Zoonotic] Primarily swine and small ruminants. Also causes high mortality in turkey. • **Route of transmission**: Ingestion of contaminated feed and water allow bacteria to access tonsils or other lymphoid tissue of the digestive tract. • **Risk factors:** Import of infected pigs and contaminated feed (imported or contamination from infected pigs) • **Incubation period**: 24 to 48 hrs **Clinical features:** • Sudden death • "Diamond" patterned skin lesions, particularly over the back. • Endocarditis ('cauliflower' like lesions on heart valves), arthritis and skin necrosis that can lead to loss of extremities • Anorexia, fever **Criteria for reporting:** Clinical suspicion AND/OR positive laboratory test result using the following methods: • Detecting the agent: culture, PCR, immunohistochemistry **References**: NSW Government. (2017). Swine erysipelas. Online Access <http://www.dpi.nsw.gov.au/__data/assets/pdf_file/0003/436440/Swine-erysipelas.pdf>. Iowa State University. (2017). Erysipelas. Online Access <https://vetmed.iastate.edu/vdpam/FSVD/swine/index-diseases/erysipelas>. NADIS. (2018). Pig Health - Erysipelas. Online Access <http://www.nadis.org.uk/bulletins/erysipelas.aspx>

	Merck Sharp & Dohme Corp. (2018). *Swine Erysipelas. Merck Manual (Veterinary Manual).* Merck & Co. Online Access <http://www.merckvetmanual.com/generalized-conditions/erysipelothrix-rhusiopathiae-infection/swine-erysipelas>
100. Theileriosis	• **Pathogen**: *Theileria* spp. parasites such as *Theileria annulata*, *T. parva etc.* • **Susceptible species**: Cattle, African buffalo, water buffalo, waterbucks, sheep, goats • **Route of transmission**: By Ixodid ticks. • **Incubation period**: 8 to 12 days in experimentally affected animals, as long as 3 weeks in naturally infected animals • **Location**: Africa, Europe and Asia **Clinical features:** • Fever, anorexia, loss of condition, decreased milk yield, petechiae and ecchymoses on conjunctiva and oral mucous membranes, severe dyspnoea, frothy nasal discharge, neurological signs, jaundice, pale mucous membranes and haemorrhagic diarrhoea • Post-mortem findings: o Petechiae and ecchymoses on the serosal surfaces of internal organs o Enlarged liver, with white foci of lymphoid infiltration present **Criteria for reporting**: Any positive laboratory test result using the following methods: • Detecting the agent: PCR, microscopy • Detecting the immune response: ELISA, IFA **References**: OIE. (2017*). Terrestrial Animal Health Code, (the Terrestrial Code*). World Organisation for Animal Health. Online Access <http://www.oie.int/index.php?id=169&L=0&htmfile=chapitre_theileriosis.htm> OIE. (2017). *Manual for Diagnostic Tests for Terrestrial Animals (the Terrestrial Manual*). World Organisation for Animal Health. Online Access <http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.04.15_THEILIERIOSIS.pdf> The Center for Food Security & Public Health. (2009). *Theileriosis*. Iowa State University. Online Access. <http://www.cfsph.iastate.edu/Factsheets/pdfs/theileriosis_theileria_parva_and_theileria_annulata.pdf> OIE. (2013). *Technical Disease Card*. Online Access http://www.oie.int/fileadmin/Home/eng/Animal_Health_in_the_World/docs/pdf/Disease_cards/THEILERIOSIS.pdf Dairy knowledge portal. Theileriosis (a protozoan disease). Online Access <http://dairyknowledge.in/article/theileriosis-protozoan-disease>.

	http://www.abc.net.au/news/2014-08-21/tick-moves-to-victoria-theileria/5685740>
101.Toxoplasmosis	• **Pathogen**: *Toxoplasma gondii* • **Susceptible species:** [Zoonotic] Felids, such as the domesticated cats, are the definitive hosts. Mammals and marsupials serve as intermediate hosts, which include small ruminants and pigs. • **Route of transmission**: Ingestion of raw or undercooked meat containing tissue cysts; from oocysts in infected soil, cat litter, contaminated vegetables/ plants and water • **Risk factors**: Close proximity with cats • **Incubation period**: 5 to 23 days **Clinical features:** • Weight loss, fever, cough, dyspnoea, diarrhoea, neurological signs (depression, circling, incoordination, seizures); behavioural, ocular or neurological deficits. • In intermediate hosts, abortion, stillbirths, mummification or fetal resorption may be seen. **Criteria for reporting:** Any positive laboratory test result using the following methods: • Detection of the agent: PCR, microscopic examination • Detection of immune response: IFA, ELISA **References**: The Center for Food Security & Public Health. (2017). *Toxoplasmosis*. Iowa State University. Online Access <http://www.cfsph.iastate.edu/Factsheets/pdfs/toxoplasmosis.pdf>.
102.Transmissible spongiform encephalopathies	• **Pathogen**: Transmissible spongiform encephalopathies (TSE) caused by prions (classical BSE prion, H-type BSE/H-BSE, L-type BSE/L-BSE/Bovine amyloidotic spongiform encephalopathy (BASE) • **Susceptible species**: [Zoonotic] Cattle, exotic ruminants, felids, humans • **Route of transmission**: Ingestion of meat, bone meal and animal feedstuffs containing BSE prion • **Incubation period**: 2 to 8 years **Clinical features**: • For classical BSE: Gait abnormalities, low head carriage, hyper responsiveness to stimuli, tremors, behaviour changes (aggression, nervousness or apprehension) **Criteria for reporting**: Any positive laboratory test result using the following methods: • Detection of the agent: Immunohistochemistry, Western immunoblot **References**: The Center for Food Security & Public Health. (2016). *Bovine Spongiform Encephalopathy*. Iowa State University. Online Access.

	<http://www.cfsph.iastate.edu/Factsheets/pdfs/bovine_spongiform_encephalopathy.pdf> OIE. (2017). *Manual for Diagnostic Tests for Terrestrial Animals (the Terrestrial Manual*). World Organisation for Animal Health. Online Access <http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.04.05_BSE.pdf>
103.Trichinellosis	• **Pathogen:** Parasitic worms of the genus *Trichinella* • **Susceptible species**: [Zoonotic] Trichinellosis can affect a range of mammals. *T. spiralis* is commonly associated with pigs. A few species can cause disease in reptiles or birds. • **Route of transmission:** The parasite has a direct life cycle. In the pigs, it is usually associated with rodents in terms of consumption of uncooked infected meat scraps or through cannibalism in rodents that may be present in pig feed causing accidental ingestion. • **Risk factors:** Inadequate rodent control on farms in which pigs may accidentally ingest Trichinella infected dead rodents. Uncontrolled cannibalism in pigs may also be a risk factor to allow for completion of life cycle of Trichinella. • **Incubation period**: Within hours • **Location**: Asia **Clinical features:** • Larvae lodged in striated muscle cells (in pigs, the diaphragm pillar and tongue have been identified as predilection sites) • Adult worms found in intestines of host species **Criteria for reporting:** Any positive laboratory test result using the following methods: • Detecting the agent: PCR, trichinoscopy, miscropic examination • Detecting the immune response **References**: OIE. (2017*). Terrestrial Animal Health Code, (the Terrestrial Code*). World Organisation for Animal Health. Online Access < http://www.oie.int/index.php?id=169&L=0&htmfile=chapitre_trichinella_spp.htm> OIE. (2017). *Manual for Diagnostic Tests for Terrestrial Animals (the Terrestrial Manual*). World Organisation for Animal Health. Online Access < http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.01.20_TRICHINELLOSIS.pdf> OIE. (2018). *General Disease Information Sheets*. Online Access <http://www.oie.int/doc/ged/D13992.PDF> Pozio, E. *Trichinellosis: general overview and OIE standards to prevent human infections through on-farm measures*. Online Access. <http://web.oie.int/RR-

	Europe/eng/events/docs/Day2_No1_Trichinellosis%20general%20overview-Edoardo%20Pozio.pdf>.
104. Trichomonosis	• **Pathogen**: *Tritrichomonas foetus* • **Susceptible species**: Cattle • **Route of transmission**: primarily by coitus, but mechanical transmission by insemination instruments or by gynaecological examination may occur. Bulls are the main reservoir of the disease and tend to be long-term carriers. • **Incubation period**: 5 to 28 days **Clinical features:** • Vaginitis • Placentitis leading to early abortion, uterine discharge, pyometra • Irregular oestrous cycles, repeated returns to service **Criteria for reporting**: Confirmation based on microscopic examination • Detection of the agent (in placental fluid, stomach contents of the aborted foetus, uterine washings, pyometra discharge, vaginal mucus or preputial smegma) using culture, PCR, microscopy **References:** OIE. (2017). *Manual for Diagnostic Tests for Terrestrial Animals (the Terrestrial Manual*). World Organisation for Animal Health. Online Access <http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.04.16_TRICHOMONOSIS.pdf>
105. Trypanosomiasis	• **Pathogen**: Protozoan parasites of the genus *Trypanosoma;* Subgenus Nannomonas *(T. congolense),* Subgenus Duttonella *(T. vivax)* and Subgenus Trypanozoon *(T. brucei ssp.)* • **Susceptible species**: Cattle, pigs, goats, sheep, horses and dogs (*T. congolense*), Wild animals including kudu, warthog, bushbuck, Bush pig, African buffalo, African elephant, white rhinoceros, black rhinoceros, wild Equidae, lion and leopard • **Route of transmission**: By Tsetse flies (*Glossina*). • **Incubation period**: 8 to 20 days • **Location**: Africa **Clinical features:** • Pyrexia, anaemia, inappetance, weight loss • Abortion **Criteria for reporting:** Any positive laboratory test result using the following methods: • Detection of the agent: Direct examination of fresh blood or buffy coat, PCR • Detection of immune response: Antibody detection ELISA, Indirect fluorescent antibody test **References**:

	OIE. (2013). *Technical Disease Card*. Online Access <http://www.oie.int/fileadmin/Home/eng/Animal_Health_in_the_World/docs/pdf/Disease_cards/TRYPANO_TSETSE.pdf>. Dairy knowledge Portal. Trypanosomiasis (Surra). Online Access http://dairyknowledge.in/article/trypanosomiasis-surra School of Medicine & Health Sciences, Research Interests. Online Access <https://smhs.gwu.edu/hovel-miner-lab/research-interests>.
106. Tularaemia	• **Pathogen**: *Francisella tularensis* • **Susceptible species**: [Zoonotic] Lagomorphs, rodents, and other mammals. • **Route of transmission:** Ingestion, inhalation, arthropods (e.g. ticks, Tabanids), direct contact with broken skin or mucous membranes • **Risk factors:** Presence of arthropods (e.g. ticks, tabanids) • **Incubation period:** 15 days • **Location**: Northern Hemisphere **Clinical features:** • Depression, ataxia, suppurating & draining lymph nodes, anaemia, and icterus **Criteria for reporting:** Any positive laboratory test result using the following methods: • Detection of agent: Isolation, PCR **References**: OIE. (2017*). Terrestrial Animal Health Code, (the Terrestrial Code*). World Organisation for Animal Health. Online Access. < http://www.oie.int/index.php?id=169&L=0&htmfile=chapitre_tularemia.htm> OIE. (2017). *Manual for Diagnostic Tests for Terrestrial Animals (the Terrestrial Manual*). World Organisation for Animal Health. Online Access <http://web.oie.int/fr/normes/mmanual/2008/pdf/2.01.18_TULAREMIA.pdf> The Center for Food Security & Public Health. (2017). *Tularemia*. Iowa State University. Online Access. <http://www.cfsph.iastate.edu/Factsheets/pdfs/tularemia.pdf>. Cree Board of Health and Social Services of James Bay. (2012). *What is Tularemia*. Online Access <http://www.creehealth.org/rabbit-fever>.
107. Ulcerative lymphangitis	• **Pathogen**: *Corynebacterium pseudotuberculosis* • **Susceptible species**: Horses and cattle to a lesser extent • **Route of transmission**: contact of infected material with traumatised skin, by biting flies, ticks or inhalation. • **Incubation period**: 3 to 4 weeks **Clinical features:** • Painful inflammation, nodules and ulcers in the region of the lower limb, or lameness and edematous swelling which extends

	up the entire limb. The exudate is odourless, thick, tan and blood tinged. Usually only one leg is involved. **<u>Criteria for reporting:</u>** Clinical suspicion AND/OR any positive laboratory test result using the following methods**:** • Detection of agent: direct microscopic examination (gram-stained smears, histopathology, electron microscopy, culture • Detection of immune response: Fluorescent antibody tests (indirect and direct), indirect enzyme-linked immunosorbent assay, passive haemagglutination test, skin hypersensitivity test **References**: OIE. (2017). *Manual for Diagnostic Tests for Terrestrial Animals (the Terrestrial Manual*). World Organisation for Animal Health. Online Access <http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.05.04_EPIZ_LYMPHANGITIS.pdf>. Mamman, P.H., Mshelia, W.P. and Fadimu, I.E. (2011). Antimicrobial susceptibility of aerobic bacteria and fungi isolated from cases of equine ulcerative lymphangitis in Kano metropolis Nigeria, Asian Journal of Animal Science, 5 (3), 175-182. Online Access. <http://www.scialert.net/fulltext/?doi=ajas.2011.175.182&org=12>.

Part B1: Diseases of Aquatic Animals and Amphibians (Notify within 24 hours)	

1.White spot disease	• **Pathogen:** White Spot Syndrome Virus (WSSV)
	• **Susceptible species:** Wide range of aquatic crustaceans (e.g. decapods, marine, brackish and freshwater prawns, crabs, crayfish and lobsters. Penaeid shrimps are highly susceptible, resulting in high mortality
	• **Route of transmission:** Horizontal via consumption of infected tissue (cannibalism/predation) and vertically**.** Apparently healthy animals can be carriers.
	  ○ Exposure or contact with infected dead or dying (moribund) organisms.
	• **Risk factors:** Environmental stressors (i.e rapid changes in salinity)
	  ○ Temperature: 18–30°C conducive to outbreaks
	
	<u>Clinical features:</u>
	• Variable mortality rate.
	• White spots embedded within the exoskeleton (barely visible to 3mm in diameter). Lethargy, colour change from pink to reddish brown, gather at edges of tanks/ponds at water surface, rapid reduction in food consumption.
	  ○ Note: **White spots not pathognomonic**: environmental stress e.g. high alkalinity or bacterial diseases can also produce white spots on carapace, and dying shrimp may have few to no white spots. Most crayfish do not show white spots when infected.
	• *For juvenile and adult shrimp:* Gross signs of white spot disease.
	• *For shrimp at any life stage:* Mortality.
	• *For shrimp and crab at any life stage:* Hypertrophied nuclei in squash preparations of gill and/or cuticular epithelium; unusual aggregates in haemolymph by dark-field microscopy; inclusion bodies in histological sections in target tissues.
	
	<u>Criteria for reporting</u>: Clinical suspicion AND/OR any positive laboratory test result using the following methods:
	• Detection of the agent: PCR, Sequencing
	
	References:
	OIE. (2016). *Manual for Diagnostic Tests for Aquatic Animals (the Aquatic Manual)*. World Organisation for Animal Health. Online Access: http://www.oie.int/en/international-standard-setting/aquatic-manual/access-online/.
	
	Lo, C.-F., & Kou, G.-H. (1998). Virus-associated white spot syndrome of shrimp in Taiwan: a review. *Fish Pathology, 33*(4), 365-371.
	
	Commonwealth of Australia. (2007). Diseases of crustaceans viral diseases – white spot disease. Online Access <http://library.enaca.org/Health/FieldGuide/pdf/White%20spot%20disease.pdf>.

Part B2: Diseases of Aquatic Animals and Amphibians (Notify within 72 hours)	
2. Infection with *Aphenomyces invadens* (Epizootic ulcerative syndrome)	• **Pathogen:** Oomycete fungus *Aphanomyces invadans* • **Susceptible species:** Range of farmed and wild fish, estuarine and freshwater (i.e. gourami, tigerfish, mullet, rainbow trout, marble goby). • **Route of transmission:** Horizontal transmission. *A. invadens* motile zoospores released in water, invade damaged fish skin, and germinate into hyphae under suitable conditions. If the conditions are unfavourable for the zoospores, they can encyst in the pond environment. • **Risk factors:** Damaged fish skin. Periods of low temperature (18–22°C in the tropics) or periods of heavy rainfall favour sporulation. Juvenile to young adults more susceptible **Clinical features:** • Varying levels of mortality. Pinpoint red spots or ulcerative lesions of varying sizes on the skin. Loss of appetite, fish become darker and hyperactive. **Criteria for reporting:** Clinical suspicion AND/OR any positive laboratory test result using the following methods: • Detection of the agent: Culture, PCR, histopathology, isolation of *A. invadens* and confirmatory identification by bioassay or PCR, PCR of tissue extracts, sequence analysis, transmission electron microscopy of tissues, observation of the oomycete hyphae in tissues or fresh squash via direct light microscopy **References** OIE. (2016). *Manual for Diagnostic Tests for Aquatic Animals (the Aquatic Manual)*. World Organisation for Animal Health. Online Access: <http://web.oie.int/eng/normes/fmanual/2.3.02_EUS.pdf> Pradhan, P., Mohan, C., Shankar, K., Kumar, B. M., & Devaraja, G. (2007). Yearlings of Indian major carps resist infection against the epizootic ulcerative syndrome pathogen, Aphanomyces invadans. *Current Science, 92*(10), 1430-1434. Queensland Government. (2017). Epizootic Ulcerative Syndrome. Online Access <https://www.daf.qld.gov.au/animal-industries/animal-health-and-diseases/a-z-list/epizootic-ulcerative-syndrome>. JSAVA. (2012). Epizootic ulcerative syndrome: exotic fish disease threatens Africa's aquatic ecosystems. Online Access <http://www.jsava.co.za/index.php/jsava/%20article/view/204/936>.
3. Koi herpes virus	• **Pathogen:** Cyprinid herpesvirus 3 (CyHV-3) • **Susceptible species:** All age groups of common carp and varieties (i.e. koi carp). • **Route of transmission:** Horizontal transmission. Entry through gills and skin, followed by a systemic spread to the internal organs (gut, kidney, spleen and liver). Virus shed through urine and faeces.

	• **Risk factors:**
	  ○ Introduction of new fish with unknown disease status.
	  ○ Poor biosecurity and husbandry practices.
	  ○ Temperature: Disease usually occurs between 16 and 25°C and does not develop at less than 13°C or more than 30°C.
	• **Incubation period**: 7 to 21 days
	
	Clinical features:
	
	• Up to 100% mortality and morbidity in severe cases. There are also cases where fish are subclinically infected.
	• Pale, swollen, mottled gills. Discolouration or reddening of the skin. Enophthalmia (sunken eyes).
	• Haemorrhages (reddening) on the skin and fins, **+/-** fin erosion.
	• Lethargy, loss of appetite, gasping at water surface.
	
	Criteria for reporting: Clinical suspicion AND/OR any positive laboratory test result using the following methods:
	
	• Detection of the agent**:** Virus isolation, Histopathology, PCR, Sequencing
	
	References:
	
	Dishon, A., Perelberg, A., Bishara-Shieban, J., Ilouze, M., Davidovich, M., Werker, S., & Kotler, M. (2005). Detection of carp interstitial nephritis and gill necrosis virus in fish droppings. *Applied and environmental microbiology, 71*(11), 7285-7291.
	
	OIE. (2016). *Manual for Diagnostic Tests for Aquatic Animals (the Aquatic Manual)*. World Organisation for Animal Health. Online Access: http://www.oie.int/index.php?id=2439&L=0&htmfile=chapitre_koi_herpesvirus.htm>
	
	Pikarsky, E., Ronen, A., Abramowitz, J., Levavi-Sivan, B., Hutoran, M., Shapira, Y., Kotler, M. (2004) Pathogenesis of acute viral disease induced in fish by carp interstitial nephritis and gill necrosis virus. *Journal of Virology, 78*(17), 9544-9551.
	
	Centre for Environment, Fisheries and Aquaculture Science. (2015). Koi Herpesvirus (KHV) disease and fisheries. Online Access <https://marinescience.blog.gov.uk/2015/10/02/koi-herpesvirus-khv-disease-and-fisheries/>.
	
	Hartman K.H., Yanong, R. P.E., Pouder, D.B., Petty, B. D., Francis-Floyd, R., Riggs, A.C. and Waltzek, T.B. Koi Herpes Virus Diseaes (KHVD). Online Access <http://edis.ifas.ufl.edu/vm113>.

4. Red Sea Bream Iridoviral disease	• **Pathogen:** Red Seabream Iridovirus (RSIV) • **Susceptible species:** More than 30 species of cultured marine fish, including red sea bream, some species of grouper and seabass. • **Route of transmission:** Horizontal transmission via water. • **Risk factors:** Stress from management or environment-related factors. Juveniles are more susceptible than adults. • **Incubation period**: 10 days

	Clinical features: • Mortality, lethargy, severe anaemia, gasping at water surface, enlarged spleen and petechiae in gills. • Darkened body **Criteria for reporting:** Clinical suspicion AND/OR any positive laboratory test result using the following methods: • Detection of the agent: PCR, Sequencing, Virus isolation • Detection of immune response: IFAT **References**: OIE. (2017). *Manual for Diagnostic Tests for Aquatic Animals (the Aquatic Manual)*. World Organisation for Animal Health. Online Access: <http://www.oie.int/index.php?id=2439&L=0&htmfile=chapitre_rsbid.htm> Noga, E. J. (2010). *Fish Diseases: Diagnosis and Treatment, 2nd Edition*. Iowa, USA: Wiley-Blackwell Publishing. pp. 519 e-FishDisease, Red sea bream iridoviral disease (RSBIVD). Online Access <http://gis.bkipm.kkp.go.id/edis/?mod=virus&id=MzQ>.

5. Spring Viraemia of Carp Virus	• **Pathogen:** Spring Viraemia of Carp virus (SVCV)
	• **Susceptible species:** Mainly cyprinid species (i.e. carp, koi carp, goldfish)
	• **Route of transmission:** Horizontal transmission via water and fomites**.** Virus gains entry via the gills and is shed into water from urine or faeces of infected fish.
	• **Risk factors:**
	  ○ Temperature: Disease outbreaks usually occur between 11-17°C and rarely occur below 10°C and above 22°C.
	  ○ Introduction or movement of fish of unknown disease status.
	  ○ Poor biosecurity practices.
	  ○ Poor husbandry practices that cause stress.
	• **Incubation period**: 7 to 15 days
	
	Clinical features:
	
	• Up to 70% mortality in European aquaculture. With sudden mortality, clinical signs may be absent.
	• Lethargy, separate from the shoal and gather at the water inlet or sides of the pond. Loss in equilibrium leading to abnormal swimming.
	• Exophthalmia (bulging eye), pale gills, haemorrhages on the skin, base of fins and vent.
	• Secondary infections by bacteria and parasites.
	
	Criteria for reporting: Any positive laboratory test result using the following methods:

	• Detection of the agent: Virus isolation, PCR, Sequencing, transmission electron microscopy • Detection of immune response **References**: OIE. (2017). *Manual for Diagnostic Tests for Aquatic Animals (the Aquatic Manual)*. World Organisation for Animal Health. Online Access: <http://www.oie.int/index.php?id=2439&L=0&htmfile=chapitre_svc.htm> The Center for Food Security & Public Health. (2007). *Spring Viremia of Carp*. Iowa State University. Online Access. <http://www.cfsph.iastate.edu/Factsheets/pdfs/spring_viremia_of_carp.pdf>. Asi, A. H. K., Bandehpour, M., Sharifnia, Z., and Kazemi, B. (2008). The First report of spring viraemia of carp in some rainbow trout propagation and breeding by pathology and moleculr techniques in iran. Asian Journal of Animal and veterinary advances, 3:263-268, <http://scialert.net/fulltext/?doi=ajava.2008.263.268>.