# Significant Disease Investigation Guide Cattle & Sheep

## Biosecurity

You play a key role in the state’s animal disease surveillance system. By reporting and investigating significant disease events you will help protect the livelihood of producers and the health of people, companion animals, livestock, and native animals. This guide aims to help you decide when to initiate a significant disease investigation (SDI) and outlines the process you need to follow. Disease information relating to cattle and sheep has been arranged by syndrome for ease of use in the field.

**A companion edition of this guide has been produced for equine and pig disease. You can obtain a copy by contacting** **cvo.victoria@ecodev.vic.gov.au**

**Disclaimer**

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## The Victorian Significant Disease Investigation Program

You play a key role in the state’s animal disease surveillance system. By reporting and investigating significant disease events you will help protect the livelihood of producers and the health of people, companion animals, livestock, and native animals. This guide aims to help you decide when to initiate a significant disease investigation (SDI) and outlines the process you need to follow. Disease information relating to cattle and sheep has been arranged by syndrome for ease of use in the field.

**A companion edition of this guide has been produced for equine disease. You can obtain a copy by contacting cvo.victoria@ecodev.vic.gov.au**

The Victorian Significant Disease Investigation (SDI) Program aims to boost Victoria’s capacity for the early detection of emergency animal diseases in livestock and wildlife by increasing the participation of veterinary practitioners and subsidising the cost of investigating significant disease events. Subsidies are available for the initial field investigation, including clinical evaluation and necropsy, laboratory testing and follow-up investigation of significant disease events in livestock and wildlife. Eligible vets are those in private practice, zoos or wildlife parks. Subsidy details can be found on the [Agriculture Victoria Significant Disease Investigation Program](http://www.agriculture.vic.gov.au/SDI) website page.

**To be considered a significant disease event and be eligible for the subsidies one**

**or more of the following criteria must be met:**

• An unusual or atypical manifestation of disease, including high morbidity, mortality and/or rate of spread; or

• An initial investigation fails to establish a diagnosis, including when

veterinary treatment does not produce an expected response; or

• There are findings suggesting a possible effect on trade, public health, biodiversity or the viability of the farm, industry or region, excluding events where there is a genuine suspicion of an emergency animal disease.

• Where there is a genuine suspicion of an exotic or emergency animal disease, the department will lead the disease investigation and cover the cost of the investigation.

**If you suspect an exotic or emergency animal disease, call the EAD Watch Hotline** **1800 675 888****.**

## Genuine suspicion of an EAD?

Immediately notify an Agriculture Victoria Animal Health or Veterinary Officer or contact the Emergency Animal Disease Watch Hotline if you suspect an exotic or emergency animal disease (EAD) or see the following with no apparent plausible explanation:

• sheep and cattle that have ulcers, erosions or blisters around the feet, muzzle, udder or mouth;

• sheep and cattle that are lame and drooling or salivating excessively;

• unusual nervous system signs in more than one animal;

• rapid spread of disease through a herd or flock;

• a disease event where multiple species are affected;

• a disease with sudden high mortality in any species.

### In the case of a sudden unexplained death in cattle or sheep, test for anthrax.

Anthrax testing should be carried out on all sudden, unexplained deaths of cattle, sheep and other susceptible livestock. Field testing of cattle and sheep carcases can be carried out using a penside immunochromatographic test (ICT). Agriculture Victoria Animal Health and Welfare staff can provide training on the use of these test kits and can provide kits at no cost. ICT results are available in 15 minutes. Do not commence a necropsy examination until anthrax has been ruled out. Wear appropriate PPE if you suspect anthrax or any zoonotic disease.

## Suspicion of zoonotic disease?

It is important to remember that some diseases have the potential to infect humans as well as animals.

• When investigating a disease outbreak, consider possible zoonotic diseases that could be responsible and take relevant precautions.

• Ensure all people in contact with the animals also take appropriate safety precautions.

## Zoonotic disease differentials for syndromes seen in cattle:

| **Syndrome** | **Disease** | **Modes of transmission** | **Precautions at the property** |
| --- | --- | --- | --- |
| Gastointestinal | Colibacillosis | Ingestion of faecalcontaminated material,food and water | Wear PPE for examination of animals.Avoid ingestion of faecal material andfaecal contaminated food and water. |
|  | Salmonellosis | Ingestion of faecalcontaminated material,food and water | Wear PPE for examination of animals.Avoid ingestion of faecal material andfaecal contaminated food and water. |
|  | Campylobacteriosis | Ingestion of faecalcontaminated material,food and water | Wear PPE for examination of animals.Avoid ingestion of faecal material andfaecal contaminated food and water. |
| Neurological | Bovine spongiformencephalopathy | Ingestion of material frominfected animal | Remove suspect animals from foodchain. Wear PPE for necropsy, cautionwith handling nervous tissue. |
|  | Rabies | In saliva via bites/scratches | Extreme care. If bitten, euthanase andtest animal - wear PPE for necropsy,caution with handling nervous tissue.Seek post exposure treatment. |
|  | Listeriosis | Direct contact with infectedanimal tissue | Wear PPE for examination of animals. |
| Reproductive | Bovine brucellosis | Direct contact / ingestion ofanimal products | Wear PPE for examination of animals.Avoid ingestion of contaminatedmaterial. |
|  | Leptospirosis | Urine, reproductive fluids | Avoid splashing or inhaling body fluids,wear PPE. |
|  | Listeriosis | Direct contact with infectedplacenta/foetus, ingestionof infected animal products | Wear PPE for examination of animals.Avoid ingestion of contaminatedmaterial. |
|  | Q Fever | Inhalation of aerosolsfrom infected animalsparticularly placenta andfluids, and contaminateddust. Direct contactthrough open wounds. | Wear appropriate PPE(particularly if not immune). |
| Respiratory signs | Bovine tuberculosis | Direct transmission byingestion, inhalation andinstillation | Remove suspect animals from foodchain. Wear PPE for necropsy. |
| Skin lesions | Ringworm | Direct contact with infectedskin | Wear gloves to examine animals. Washhands and equipment. |
|  | Pseudocowpox | Direct contact with infectedcattle | Wear gloves to examine animals. Washhands and equipment. |
| Sudden death | Anthrax | Direct contact with infected fluid and tissues | Wear PPE for examination of animals,avoid contamination from dischargesand avoid opening carcass. |
| Neurological | Scrapie | Ingestion of neural tissuefrom an infected animal. | Remove from food chain. Do renderas blood and bone meal. Wear PPE forexamination of animals. |
|  | Listeriosis | Ingestion of infected brain | Remove from food chain. Wear PPE forthe examination of animals. |
|  | Hydatids | People – ingestion oftapeworm eggs (infecteddog licking face) | Personal hygiene about farm dogs |
| Reproductive (abortion) | Consider all casespotentially due to azoonotic agent | Ingestion, inhalation, acrossmucous membranes.Mosquito bites (Rift ValleyFever) | Wear PPE including P2 masks andgoggles |
| Reproductive (mastitis and orchitis) | *Brucella melitensis* | Ingestion, inhalation, acrossmucous membranes | Wear PPE including P2 masks andgoggles. Consume only pasteurisedsheep and milk products. |
| Respiratory | Tuberculosis (exotic) | Ingestion, inhalation, acrossmucous membranes | Remove from food chain. Wear PPE forexamination of animals. |
| Skin lesions | Dermatophilosis | Skin contact with wet,contaminated fleeces | Wear PPE for the examination of animals |
|  | Orf (scabby mouth) | Skin contact | Wear PPE for the examination of animals |
| Sudden death | Anthrax | Direct contact with infected fluids and tissues | Wear PPE for the examination of animals, avoid contamination from discharges and avoid opening carcass. |

## What should be collected in the field?

### To complete the Recordof Disease Event form (RODE) and laboratory submission form you will need to gather

### these details.

• Species. Is more than one species affected?

• Number of deaths, number sick, number at risk, number examined.

• Age, condition score, sex.

• History and predisposing factors.

- When did the outbreak begin?

- What is the recovery time?

- What vaccinations and treatments have the

animals had?

- Recent livestock introductions?

Consider possible sources of introduction/spread. Grazing/feeding history, pasture/feed type

and weed species (if suspect plant toxicity).

### Timeline

• Sequence dates of disease cases and note clusters.

– Find the first case – what happened before it?

– Note other events that happened on the property within the timeline.

– What’s different when cases don’t occur?

### Details of the location

• Take GPS coordinates if possible.

• Address and PIC.

• Physical factors.

– Infrastructure

– Geography

– Soil

– Vegetation

– Water sources

• Photos of layout and significant features.

• Spatial mud map of where cases occurred.

– Identify clusters of cases.

– Overlay geography and infrastructure.

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## Good blood collection

Careful handling of blood samples gives the best chance for thorough investigation and accurate diagnosis.

• Make sure you select the correct sample tube for the required tests

• Fill blood tubes

• Avoid haemolysis:

– remove needle before transferring blood from a syringe to a tube

– leave clot tubes standing upright to clot

– mix anticoagulant tubes gently

– allow tubes to cool in esky before placing on an ice block, don’t freeze

– don’t allow tubes to overheat

|  |  |  |
| --- | --- | --- |
| **Tube type** | **Description** | **Tests** |
| Serum separation and clot activatorAllows the clot to form so serum can be analysed. | Gold and red tops | Serology, Antibody and antigen tests, Clinical biochemistry |
| EDTAContains anticoagulant | Purple tops | Haematology, Haemoparasite Virus isolation, Polymerase chain reaction (PCR) |
| Lithium heparinContains anticoagulant | Green tops | Clinical biochemistry |

**Please collect two of the following blood samples from each of 10 animals (five affected, five clinically normal) – 2 x clotted bloods and 2 x EDTA bloods.**

## Good tissue sample collection

Careful collection of tissue gives the best chance for thorough investigation and accurate diagnosis

**Ensure samples are representative of lesions**

• sample the interface with normal tissue

• areas of different colour or consistency

• consider multiple sections for large lesions

**Take fresh and fixed tissue samples**

**Fixed tissue**

• use 10 times the volume of 10% buffered formalin as tissue

• can be drained before transportation (allow at least 24 hours for tissues to fix) -add a few millilitres of formalin to moisten tissue and seal well

**Fresh tissue**

• place in individual sterile containers and chill in esky/fridge.

|  |  |  |
| --- | --- | --- |
| **Organ** | **Sample Size** | **Don’t forget** |
| Liver and spleen | 10mm cube (fresh), 20mm long x 8mm wide (fixed), 50mm cube (fresh liver and kidney for toxicology) | Multiple samples of normal tissue and pathology |
| Kidney | 10mm cube (fresh), 20mm long x 8mm wide (fixed), 50mm cube (fresh liver and kidney for toxicology) | Cortex, medulla, pelvis and stones |
| Heart | 10mm cube (fresh), 20mm long x 8mm wide (fixed), 50mm cube (fresh liver and kidney for toxicology) | Left and right ventricles, atrium, septum, valves |
| Lung | 10mm cube (fresh), 20mm long x 8mm wide (fixed), 50mm cube (fresh liver and kidney for toxicology) | Cranio-ventral and dorso-caudal areas |
| Lymph nodes | Whole lymph node (half fresh and half fixed) | Label container to identify which lymph node. |

## Additional sample collection guide for syndromes seen in cattle

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Blood Clotted** | **Blood EDTA** | **Blood Smear** | **Faeces & Urine** | **Priority tissue samples** | **Other samples** |
| Ill thrift | Yes | Yes | Yes | Yes  | Liver, kidney, heart, lung, spleen,GIT, lymph nodes | Any lesions |
| Neurological | Yes | Yes | Yes |  | Brain, spinal cord, liver, kidney,heart, skeletal muscle | Rumen and intestinal contents,cerebrospinal fluid, aqueoushumour, any lesions.Fresh kidney (50g) if suspectlead poisoning |
| Oral lesions | Yes  | Yes  | Yes |  | Vesicular fluid, epithelium fromvesicles, oral, nasal, vesicular andtonsillar swabs in VTM or saline | Spleen, liver, lung, GIT, lymphnodes, any lesions. |
| Reproductive | Yes | Yes |  |  | Aborted / stillborn foetus andplacenta,Pericardial and intrathoracicfluid from foetus |  |
| Respiratory signs | Yes | Yes | Yes |  | Lung, trachea, bronchial lymphnodes, pleural fluid, any lesions | Oral and nasal swabs in VTM(Viral and Transport Media)Bacto swab of lesions in TM(Transport Media) |
| Skin lesions | Yes  | Yes | yes |  | Skin lesion, skin scrapings,pustular lesion swab in VTM,external parasites (70% alcohol) | Liver, kidney, any lesions |
| Sudden death (perform anthraxICT prior to openingcarcass. Do NOTperform necropsyif the anthrax ICT ispositive) | Yes | Yes | Yes | Yes | Brain, liver, kidney, heart, skeletalmuscle, lymph nodes, any lesions | Fluid from body cavities, bonemarrow, aqueous humour, anysuspect toxins. |

## Additional sample collection guide for syndromes seen in sheep

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Blood clotted** | **Blood EDTA** | **Blood smear** | **Faeces & Urine** | **Priority tissue samples** | **Other samples** |
| Ill thrift | Yes | Yes | Yes | Yes | Liver, kidney, heart, lung, spleen,GIT, lymph nodes | Any lesions |
| Neurological | Yes | Yes | Yes |  | Brain, spinal cord, liver, kidney,heart, skeletal muscle | Rumen and intestinal contents,cerebrospinal fluid, aqueoushumour, any lesions.Fresh kidney (50g) if suspectlead poisoning |
| Oral lesions | Yes | Yes | Yes |  | Vesicular fluid, epithelium fromvesicles, oral, nasal, vesicular andtonsillar swabs in VTM or saline | Spleen, liver, lung, GIT, lymphnodes, any lesions |
| Reproductive | Yes | Yes |  |  | Aborted / stillborn foetus and placenta,vaginal mucous or cervical mucousfrom cow, preputial wash from bullPericardial and intrathoracic fluidfrom foetus. |  |
| Respiratory signs | Yes | Yes | Yes |  | Lung, trachea, bronchial lymphnodes, pleural fluid, any lesions | Oral and nasal swabs in VTMBacto swab of lesions in TM |
| Skin lesions | Yes | Yes | Yes |  | Skin lesion, skin scrapings,pustular lesion swab in VTM,external parasites (70% alcohol) | Liver, kidney and any lesions |
| Sudden death (perform ICT prior to opening carcass. Do NOT perform necropsy if the ICT is positive) | Yes | Yes | Yes | Yes | Brain, liver, kidney, heart, skeletalmuscle, lymph nodes, any lesions | Fluid from body cavities, bonemarrow, aqueous humour, anysuspect toxins |

## Differential diagnosis for syndromes seen in cattle (not a complete list of diseases)

|  | **Exotic** | **Endemic** | **Lab will undertake** |
| --- | --- | --- | --- |
| Ill thrift | • Surra• Haemorrhagic septicaemia• Jembrana• Tick fever (babesiosis andanaplasmosis) (exotic to Victoria) | • Bovine Viral Diarrhea Virus (BVDV-1) /Mucosal Disease• Johne’s disease• Intestinal worms and Coccidiosis• Liver Fluke• Theileriosis• Acute Bovine Liver Disease• Blue Green Algae• Trace mineral deficiency• Chronic plant toxicity | Surra – CATT, ELISA, PCR |
| Gastrointestinal | • Rinderpest | • Mucosal disease (BVDV)• Bovine Malignant Catarrh• Salmonellosis• Yersiniosis• Johne’s disease• Intestinal worms andCoccidiosis |  |
| Neurological | • Bovine Spongiform Encephalopathy• Rabies• Heartwater | • Botulism• Bovine Herpesvirus (BHV- 5)• Toxicity - Chemical / plant• Polioencephalomalacia• Metabolic – Grass Tetany, Ketosis,Hypocalcaemia• Neoplasm | BSE - Histology |
| Oral lesions | • Foot and Mouth Disease• Vesicular stomatitis• Bluetongue• Jembrana | • Mucosal disease (BVDV-1)• Bovine Malignant Catarrh• Bovine papular stomatitis• Actinobacillosis and actinomycoses• Non-infectious causes such as trauma | FMD – ELISA & PCRVS – VNT, virus isolation(referral) |
| Reproductive | • Bovine brucellosis• Bovine Viral Diarrhoea Virus (BVDV-2)• Infectious pustular vulvovaginitis• Bovine Herpesvirus, exotic serotype• Rift Valley fever | • Vibriosis• Trichomoniasis• Bovine Viral Diarrhoea Virus (BVDV-1)• Leptospirosis• Arboviruses – Akabane, Bovine Ephemeral Fever | Brucellosis – RBT, CFT, PCR,Culture |
| Respiratory signs | • Contagious BovinePleuropneumonia• Bovine tuberculosis• Bluetongue• Bovine Herpesvirus, exoticserotypes• Meliodosis | • Bovine Respiratory Disease• Infectious Bovine Rhinotracheitis (BHV-1.2b)• Pneumonia• Bovine Ephemeral Fever• Lung worm | CBPP – Histology, PCR,CultureTB – Histology, PCR, Culture |
| Skin lesions | • Lumpy skin disease• Bluetongue• Aujeszky’s• Surra• Screw Worm Fly• Haemorrhagic septicaemia• Irritation from cattle tick or buffalo fly | • Acute Bovine Liver Disease• Bovine Herpes Virus (BHV-2)• Bovine papillomavirus (Warts)• Photosensitisation• Ringworm• Mange (*Chorioptes bovis* or *Demodex bovis*)• Enzootic Bovine Leucosis | LSD – Histology, EMmicroscope |
| Sudden death | • Haemorrhagic Septicaemia• Rinderpest• Foot and Mouth Disease (youngcalves)• Tick fever (babesiosis andanaplasmosis)• Bluetongue | • Anthrax• Toxicity – Chemical / plant• Clostridial diseases – Enterotoxaemia,Tetanus, Black Leg, Black disease• Mucosal disease (BVDV)• Theileriosis• Acute Bovine Liver Disease• Bovine Malignant Catarrh• Botulism• Metabolic diseases• Blue Green Algae poisoning• Lightning strike | HS – PCR, Culture |

## Differential diagnosis for syndromes seen in sheep (not a complete list of diseases)

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Exotic** | **Endemic** | **Lab will undertake** |
| Ill thrift | • Maedi-Visna• Scrapie• Bluetongue (BTV)• Foot and Mouth disease | • Johne’s disease• Intestinal Worms and Coccidiosis• Liver Fluke• Blue Green Algae• Trace mineral deficiency• Chronic plant toxicity• Malnutrtiion• Worms (Haemonchus or scour worms)• Paratuberculosis• Toxicities (eg pyrrolizidine alkaloidosis) | BTV serology andPolymerase Chain Reaction(PCR). FMD on cattle.Histology for scrapie andMaedi-Visna |
| Gastrointestinal | • Peste des Petits Ruminants (PPR)• Rift Valley Fever• Bluetongue Virus• Lamb dysentry | • Johne’s disease• Toxicity (Plant / Chemical)• Scour worms• Salmonellosis• Yersiniosis• Coccidiosis | Virology for PPR, Rift ValleyFever and Bluetongue Virus. |
| Neurological | • Scrapie• Maedi-Visna | • Toxicity – Chemical / plant• Polioencephalomalacia• Metabolic• Listeriosis• Staggers diseases• Toxicological syndromes• Pregnancy toxaemia | Histology for Maedi-Visnaand Scrapie |
| Oral lesions | • Foot and Mouth disease• Bluetongue Virus• Peste des Petits Ruminants (PPR)• Rift Valley Fever (RVF) | • Traumatic lesions (eg grass seeds)• Renal failure | Virology for FMD, BluetongueVirus, Peste des PetitsRuminants (PPR) and RiftValley Fever (RVF). |
| Reproductive | • *Brucella melitensis*• Rift Valley Fever• Bluetongue Virus• Foot and Mouth disease | • *Brucella ovis* (rams)• Abortive agents (Camplyobacter, Listeria,Toxoplasma, etc)• Malnutrition | Bacterial culture for Brucella.virology for Rift Valley Fever,Bluetonge Virus and FMD. |
| Skin and fleece lesions | • Scrapie• Sheep Pox• Sheep Scab | • Photosensitisation• Lice• Flystrike• Scabby mouth• Photosensitisation | Histology, Virology, Parasitologyfor these. |
| Sudden death | • Peste des Petits Ruminants• Rift Valley Fever• Bluetongue Virus• Foot and Mouth disease (lambs) | • Anthrax• Clostridial diseases – Enterotoxaemia,Tetanus, Black Leg, Black disease• Metabolic diseases• Blue Green Algae• Pulpy kidney• Tetanus• Other Clostridial diseases• Salmonellosis• Hypocalcaemia | Virology for Peste des PetitsRuminants, Rift Valley Fever,Bluetongue Virus, FMD. |
| Lameness | • Foot and Mouth disease• Bluetongue Virus | • Footrot• Benign footrot• Foot abscess | Virology for FMD andBluetongue Virus |

* There are subsidies available for TSE testing. Contact Agriculture Victoria.

## Handling samples in the field

• Ensure samples are taken prior to giving treatments (where possible).

• Ensure enough samples are collected to represent the whole herd.

• Collect fresh and fixed samples first, then gut samples.

• Label samples as soon as you take them.

• Ensure labelling is clear and indelible. Record Property Identification

Code (PIC), animal identification, date and vet on label.

• Tissue samples should be prepared as both fresh and fixed.

• Use plenty of 10% formalin to fix tissues.

• Fix for 24 hours then formalin can be drained off for transport. Add a few

mL of formalin to the container, or wrap tissue in paper towel moistened

with formalin, and place in leak proof container.

• Clean any surface contamination from tubes and containers.

• Place tubes/vials into zip-lock bags to keep them clean and contained

together.

• Keep fresh samples cool while in the field with ice bricks.

• Don’t leave samples standing in the sun while working.

• Use an esky and ice bricks to store samples in transit.

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## Ill thrift

### Clinical signs

• Depressed animals.

• Weight loss or failure to gain weight.

• Emaciation.

• Sudden losses in production.

• Weakness.

• Lethargy.

• Cattle: oedema in lower parts of body.

• Cattle: swollen lymph nodes.

• Cattle: death.

• Tail in mob.

• Diarrhoea (possibly).

• Bottle jaw.

• Sheep: Fleece break.

### Samples to collect

• Acute and convalescent blood samples for serology –collect in clot tubes and EDTA.

• Blood smears.

• Tissue samples of any lesions found.

• Tissue samples from dead animals – lymph nodes,

liver, kidneys, heart, lung, spleen, GIT.

• Faeces.

• Urine.

### Remember to ask

• How long have the animals been affected?

• What proportion of animals are affected?

• Are other species affected, what are they?

• Have any animals been introduced to the property?

• Have any animals been removed from the property?

• Have you had a problem with biting or blood-sucking insects?

• Drenching history.

• Any supplementary feeding?

• Any history of Johne’s disease and is the flock/herd vaccinated?



## Neurological signs

### Clinical signs

• Behavioural changes.

• Unusual vocalisation.

• Unusual posture and gait.

• Puritis and self-trauma.

• Sheep: fleece derangement.

• Sheep: Fall over when moved.

• Weakness.

• Ataxia.

• Paralysis.

• Blindness.

### Samples to collect

• Acute and convalescent blood samples for serology – collect in clot tubes and EDTA.

• Blood smears.

• Tissue samples of any lesions found.

• Tissue samples from dead animals

– liver, kidneys, brain, spinal cord, heart, spleen.

• Aqueous humour.

• Smears of brain, vascular tissue and spleen.

• Fluid from body cavities.

• Rumen and intestinal contents.

• Faeces.

• Urine.

• Transmissable Spongiform Encephalopathies (sheep scrapie, cattle BSE) specific samples, up to two animals.

### Remember to ask

• How long have the animals been affected?

• What proportion of animals are affected?

• Are other species affected, what are they?

• Have any animals been introduced to the property?

• Have any animals been removed from the property?

• Has there been any recent rainfall?

• Have animals had access to a rubbish dump?

• Has any new equipment or feed been brought onto the property?

• Sheep: What have they been grazing?

## Oral lesions and vesicular diseases

### Clinical signs

• Unwillingness to eat.

• Excess salivation.

• Depressed animals.

• Fever.

• Vesicles/erosions/ulcerations in the mouth.

• Check if animals also present with:

– lameness

– reluctance to move

– similar lesions on the feet or the teats.

### Samples to collect

• Vesicular fluid – from unruptured vesicles collect via a syringe or a swab and place in plain sterile tube.

• Nasal, oral and tonsillar swabs.

• Place swabs in 0.5ml of phosphate buffered saline or viral transport media.

• Epithelium from unruptured vesicles.

• Epithelial tags from freshly ruptured vesicles: 1–2 cm.

• Oropharyngeal fluid, collected with a probang, if this is available.

• Acute and convalescent blood samples for serology – collect in clot tubes and EDTA.

• Tissue samples from dead animals – lymph nodes, spleen.

### Remember to ask

• How long have the animals been affected?

• What proportion of animals are affected?

• Are other species affected, what are they?

• Have any animals been introduced to the property?

• Have any animals been removed from the property?

• Has any new equipment or feed been brought onto the property?

• Have there been visitors to the property recently?

• Has anyone who has contact with the animals been overseas recently?

• What have they been grazing?



## Reproductive signs

### Clinical signs

• Low pregnancy/scanning rate.

• Low calving/lambing rate, low marking or weaning rates.

• Protracted lambing/calving.

• Abortion.

• Stillborn calves/lambs.

• Weak calves/lambs.

• Retained placentas.

### Samples to collect

• Blood samples from live animals for serology – collect in clot tubes and EDTA.

• Swabs from placenta or foetus.

• Pericardial and thoracic fluid from aborted/stillborn foetuses.

• Swab of uterine discharge – place swabs in 0.5ml of phosphate buffered saline or viral transport media.

• Whole placenta or foetus chilled.

• Tissue samples from foetus– liver, kidneys, lung, brain, heart.

• Sheep: foetal abomasum.

### Remember to ask

• Do you pregnancy test your herd/flock?

• What are your pregnancy testing, calving/lambing results?

• Have you noticed any aborted foetuses in the paddocks or yards?

• Have you noticed any deformed calves/lambs?

• Do you vaccinate for reproductive diseases?

• Sheep: Do you vaccinate for abortion in ewes?

• Sheep: When did you mate these ewes?

• Do you run heifers and cows and maiden ewes/ewes separately?

• Have you introduced new bulls/rams to the property and how have they been managed?

• Do you have significant problems with wild dogs?

• Sheep: Have you tested your rams for *Brucella ovis*, or are they all from accredited studs?

• Sheep: What has ewe nutritional status been like at mating and throughout pregnancy?

## Respiratory signs

### Clinical signs

• Coughing.

• Rapid respiration.

• Nasal discharge

– mucopurulent

– frothy

– bloody.

• Tail in mob.

• Respiratory distress.

• Conjunctivitis.

• Sudden death.

### Samples to collect

• Nasal, oral and tonsillar swabs.

• Swabs from lesions.

• Acute and convalescent blood samples for serology.

• Collect in clot tubes and EDTA.

• Tissue samples of any lesions found.

• Tissue samples from dead animals – lymph nodes,

liver, kidneys, pleural fluid, spleen.

### Remember to ask

• How long have the animals been affected?

• What proportion of animals are affected?

• Are other species affected, what are they?

• Have any animals been introduced to the property?

• Have any animals been removed from the property?

• Have the animals been transported recently?

• Are there any wild/feral animals which could contact stock?

• Sheep: Have the animals been lot or confinement fed?

• Sheep: Have they been droved, yarded, transported or shorn recently?

## Skin lesions

### Clinical signs

• Depressed animals.

• Maggots in wounds or openings such as eyes.

• Cutaneous nodules – may become necrotic.

• Enlarged lymph nodes.

• Sheep: odour of flystrike.

• Oedema in limbs and ventral parts of body.

• Scratching, biting, rubbing and itching.

• Loss of hair/wool.

• Sheep: fleece derangement.

• Scabs.

### Samples to collect

• Acute and convalescent blood samples for serology

– collect in clot tubes and EDTA.

• Nasal, oral and tonsillar swabs.

• Place swabs in 0.5ml of phosphate buffered saline or viral transport media.

• Skin scrapings at site of lesions and adjacent tissue.

• Crusts, scabs and swabs from lesions.

• Any external parasites found (in 70% alcohol).

• Fresh and fixed tissue samples from

dead animals - lymph nodes, kidney, liver, spleen.

### Remember to ask

• How long have the animals been affected?

• What proportion of animals are affected?

• Are other species affected, what are they?

• Have any animals been introduced to the property?

• Have any animals been removed from the property?

• Has any new equipment been in contact with the animals?

• Do you have problems with biting insects?

• Sheep: What fly control measures do you use?

• Sheep: Do you have a problem with straying sheep?

• Sheep: Have you bought sheep in the past 12 months?



## Sudden death

## Clinical signs

• Single or multiple animals found dead.

• Death not preceded by obvious signs of disease.

• Animals dying in rapid succession.

### Samples to collect

• Perform anthrax ICT before conducting necropsy.

• Blood samples from live affected and normal

animals for serology, collect in clot tubes and EDTA.

• Swabs from any lesions found.

• Swab of any bloody discharge from any orifice.

• Tissue samples of any lesions found.

• Tissue samples from dead animals – lymph nodes,

liver, kidneys, lung, brain, bone marrow, spleen.

• Fluid from body cavities.

• Faeces.

• Urine.

### Remember to ask

• What have weather conditions been like lately?

• How long have the animals been dying?

• What proportion of animals have died?

• Are other species affected, what are they?

• Have any animals been introduced to the property?

Have any animals been removed from the property?

• Has any new equipment or feed been brought on to the property?

• Has anyone travelled overseas recently? To where?

• Any property or locality history of anthrax?

**In the case of a sudden unexplained death in cattle or sheep, test for anthrax.**

Anthrax testing should be carried out on all sudden, unexplained deaths of cattle, sheep and other anthrax susceptible livestock. Field testing of cattle and sheep carcases can be carried out using a penside immunochromatographic test (ICT). Agriculture Victoria Animal Health and Welfare staff can provide training on the use of the test kits and can provide kits at no cost. ICT results are available in 15 minutes.



## Gastrointestinal disease

### Clinical signs

• Scouring, diarrhoea, dags.

• Weight loss.

• Depression.

• Production loss.

• Deaths.

### Samples to collect

• Faecal samples: individual from sick, and bulk (10+) from stock.

• Blood samples from live affected and normal animals in EDTA and clot tubes.

• Tissue samples (fresh and fixed) from any lesions seen at necropsy.

• Tissue samples (fresh and fixed) from along the GI tract: rumen, abomasum, proximal duodenum,

jejunum, ileum, caecum, colon.

• Gut contents.

• Fluid from body cavities.

### Remember to ask

• Drenching history?

• How long have the stock been on the property?

• What proportion of the stock are affected (just this mob, or others)?

• Are any other species affected?

• What are they grazing or being fed?

## Lameness in sheep

### Clinical signs

• Lameness.

• Weight loss.

• Tail in mob.

### Samples to collect

• Examine feet.

• Swabs from lesions in interdigital space or underrun hoof.

• Scabs if present.

• Blood samples from normal and affected animals in EDTA and clotted tubes.

### Remember to ask

• Do you footbathe the stock?

• Have you bought in stock in the past 12 months?

• Do you have a problem with straying stock?

• Have your sheep had footrot before?

• Have you attempted to eradicate footrot in the past?

• Have you noticed increased insect activity after heavy

rain?



## Practising good biosecurity

## Vehicles, clothing, footwear and equipment can all spread disease between properties

• Take cleaning equipment in your vehicle.

• If possible, leave your vehicle outside the property.

• Include a bucket, brush, disinfectant and bin bags. Common disinfectants such as chlorine based and Virkon are effective against most infectious agents.

• Put clean overalls on over your clothes before entry.

– clean disposable or dedicated overalls.

– clean gumboots.

• Wear disposable gloves to collect samples.

• Establish clean and dirty zones at the entrance to the property.

• Equipment, clothing and footwear that have been in contact with the dirty zone, must be cleaned or placed in bags when exiting the dirty zone.

• Always clean before disinfecting. Mud and dirt can prevent disinfectants from being effective.

• Pay particular attention to footwear, hands and fingernails as well as equipment used on animals.

• Collect all waste and disposable equipment in a plastic bin bag.

• Remove overalls as you depart the property and place in a plastic bag.

• All mud and dirt should be cleaned from your boots, including the soles.

• Once cleaned the boots should be disinfected.

• Clean vehicle on exit from the property, paying particular attention to wheel arches and tyres.



**If you suspect a notifiable disease call the EAD Watch Hotline for advice before leaving the**

**property. Do not allow animals to be moved off the property. Leave disposable equipment**

**securely on the property for later disposal post investigation.**

## Packaging samples for transport

• Refrigerate samples as soon as you return from the property.

• Do NOT freeze samples.

• List all samples taken on the submission form.

• Samples must be sent to the Veterinary Diagnostic Services AgriBio laboratory as soon as practical.

• Place all sample containers in zip-lock bags for transport.

• Place bags of samples in a rigid container (esky/cool box).

• Use absorbent material to line container in case of leaks.

• Pack all samples with ice blocks in the transport container.

• Do not pack with wet ice.

• Place laboratory submission form in a separate zip lock bag within the transport container.

• Seal the container with tape.

• If sending via courier, place the consignment note on top of the container.

• If samples are travelling by air, packing must comply with the dangerous goods regulations for

– UN3373, Biological substances, Category B.

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## Submitting samples and reports.

**Veterinary Diagnostic Services**

**AgriBio Specimen reception**

**Main Loading Dock**

**5 Ring Rd**

**Latrobe University**

**Bundoora 3083**

**Phone: (03) 9032 7515**

**Fax: (03) 9032 7604**

**Email:** **vet.diagnostics@ecodev.vic.gov.au**

## Please contact your local Agriculture Victoria veterinary officer for further information

ATTWOOD 9217 4200

ELLINBANK 5624 2222

SEYMOUR 5735 4300

BAIRNSDALE 5152 0600

GEELONG 5226 4667

SWAN HILL 5033 1290

BALLARAT 5336 6856

HAMILTON 5573 0900

TATURA 5833 5222

BENALLA 5761 1611

HORSHAM 4344 3111

WANGARATTA 5722 7101

BENDIGO 5430 4444

LEONGATHA 5662 9900

WARRNAMBOOL 5561 9946

COLAC 5233 5504

MAFFRA 5147 0800

WODONGA (02) 6043 7900

ECHUCA 5482 1922

RUTHERGLEN (02) 6030 4500

**Information correct 2019.**

**Please check the Agriculture Victoria website for your current SDI contact**