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Moredun

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biosecurity

for key livestock diseases

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BIOSECURITY

big 5

1 Livestock movement

This is the most likely route for introducing disease. Run closed herds and flocks, otherwise buy from accredited schemes or trusted sources

2 Quarantine

Always keep introduced animals isolated. Ensure best practice quarantine conditions and check quarantine periods for key diseases

3 Diagnostic tests and preventative vaccines

Use these whenever recommended as knowing disease status is important and prevention is better than cure

4 Hygiene

Practice good hygiene including the use of effective disinfectants. Provision of good environmental conditions will lead to reduced risk of infection

5 Health Plans

Improve disease prevention and control by developing flock and herd health plans in consultation with your vet. Use and update them regularly

key

- Accreditation or official control
- Disinfection - premises etc
- Diagnostic/testing advised
- Best practice guidelines
- Quarantine and time
- Transmissible to humans
- Vaccine available
- Treatment

introduction

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BIOSECURITY means taking steps to prevent the introduction and spread of infectious disease. As a critically important part of disease prevention and control, biosecurity should be continually addressed as part of normal farm management. As livestock farms strive towards net zero, improving biosecurity on your farm will prevent disease, increase production efficiency, reduce waste and greenhouse gases (GHG), increase profitability, and improve animal health and welfare. Several of the livestock diseases featured here are known to be zoonotic, leading to increased risk to public and environmental health - improving biosecurity helps reduce disease transmission. With antimicrobial and anthelmintic resistance also on the rise, good biosecurity practice is key to a One Health solution, where both livestock and public health are protected.

This fact sheet and accompanying poster can be used as part of an animal health plan to reduce or prevent disease burden. Some important points to successful biosecurity are outlined below:

- Good biosecurity practices should be applied to newly purchased livestock and to returning stock from overwintering or summer grazing. Remember these animals have been off-farm and potentially mixing with animals from other holdings or wildlife.
- Adopt a closed herd or flock policy wherever possible, but if you do have to purchase livestock always aim to purchase animals that have been accredited under a recognised Health Scheme or at least know the disease status of the farms you are purchasing from. Try to purchase directly from individual flocks or herds and move animals directly from the farm of origin to their new premises in your own transporter.
- When moving animals onto the farm, always ensure they undergo an adequate period of quarantine in secure accommodation before introduction to your existing animals. Check the quarantine period for the diseases you are trying to prevent as there are different recommended quarantine times for different diseases. For most of the key diseases it is crucial that you 'isolate' rather than 'separate' incoming stock from those already in the herd or flock.

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Never mix animals together without considering the possible disease risks

- A disinfectant footbath, brush and separate over-clothes should be provided at the entrance to the quarantine building.
- Quarantined animals should be fed, watered, and inspected last, followed by handwashing where possible.
- Diagnosis is critical to effective disease control and many key diseases now have sensitive diagnostic tests and/or preventative vaccines available. Any testing and vaccination programmes are best discussed with your vet and included in interactive health plans to ensure timely and accurate application.
- Check and test animals for disease and treat if necessary. For the individual farmer, quarantine treatments have an economic benefit as any required treatments are confined to a small group of animals rather than a whole flock or herd.
- Good environmental hygiene, such as clean, disinfected premises, equipment and personnel is very important in the prevention and control of disease. Different diseases may require particular disinfectants; therefore, it is critical you select the correct disinfectant. Poor hygiene and environmental conditions lead to increased risk of infection. Strive to improve standards in animal buildings and in feed storage areas.
- Develop pro-active strategies for disease prevention rather than adopting a reactive approach. Discuss the development of health plans, disease surveillance programmes and disease response strategies with your vet on a regular basis. Interactive health plans are crucial and allow both vet and farmer to work remotely on the same document ensuring regular updating and checking.
- Farm security is critical for disease control. Examine ways in which you can improve farm security to prevent animals or people from inadvertently bringing in diseases. Focus on farm boundaries such as fencing, farm entry and exit points and farm buildings.
- Zoonotic pathogens may be transmitted between livestock and people. Some of these pathogens can cause disease in both animals and people, while others may be more of a public health risk e.g., food and water-borne pathogens. Application of targeted biosecurity interventions will help to reduce pathogen transmission and protect animal, public and environmental health.

cattle

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biosecurity information for farmers:

Disease control when purchasing or bringing in stock

Bovine Tuberculosis (TB)

- Notifiable disease
- Compulsory
- Until test results confirm clear
- FAM diluted at 1:20

Mode of transmission

Aerosol infection by respiratory discharges from infected cattle, or by eating feed contaminated by sputum, milk, urine or faeces from infected cattle or wildlife.

Diagnosis/Testing

In the UK whole or partial herd testing of cattle takes place on a statutory routine basis, using the Single Intradermal Comparative Cervical Tuberculin (SICCT) or skin test. Inter-test intervals (6 months to 4 years) are determined by the classified risk status of the area in which the farm is situated. England is divided into High Risk Areas (HRA), Low Risk Areas (LRA) and Edge Areas and Wales has high, intermediate, and low TB areas. In Scotland some low-risk herds are exempt from routine herd testing, but the default interval between routine tests is 4 years.

If cattle are to be moved from higher risk to lower risk areas, they require a clear skin test pre-movement and then a post-movement test at specified timings pre- and post-movement. These tests are paid for by the farmer unless they coincide with the timing of the statutory tests.

Pre-movement testing with clear results is required for cattle coming into Scotland from **all parts of England and Wales** (updated May 2023). The test needs to have been carried out within 30 days of the movement. The major exceptions to this are for calves less than 6 weeks old and those cattle going straight to slaughter. A clearing herd test (allowing restrictions to be lifted in a breakdown herd) cannot count as a pre-movement test.

Pre-movement testing with clear results is required within 60 days of movement of cattle from farms in the HRA and Edge areas of England and all of Wales to other farms in England and Wales.

Post-movement testing is now compulsory in Scotland for cattle brought in from areas of England and Wales with 2-yearly or more frequent routine herd testing (High Incidence Area HIA- includes HRA, Edge and all of Wales) and from Northern Ireland. This must happen between 60 and 120 days after arrival in Scotland.

In England, cattle moved from the HRA, Edge and Wales to the LRA require post-movement testing 60-120 days after movement. In Wales post-movement tests are required for cattle moved into the low TB areas from high and intermediate areas of Wales, from the HRA and Edge in England and from Northern Ireland.

From 1st August 2023 post-movement testing will also be required when cattle are moved from the HRA, 6-monthly testing areas of the Edge, and Wales to the annual testing areas of the Edge.

The rationale for post-movement testing is that the skin test only detects 80% of infected animals so repeated tests will increase the likelihood of detecting infected animals before they cross-infect other cattle and possibly wildlife on the new farm.

Quarantine time: In Scotland, England and Wales, all animals eligible for post-movement testing are required to be held on the original destination premises until a clear post-movement test has happened. Where possible these cattle should be isolated from others on the farm.

Cattle going to slaughter within 120 days of arriving on a Scottish/ English or Welsh holding are exempt from post movement testing, assuming relevant pre-movement testing rules were followed.

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Quarantine conditions

Assuming post movement testing is planned:

If housed, use a building with separate airspace not shared with any cattle already resident on farm.

If at pasture, use grazing 1 field away from resident stock on all field boundaries, or at least double fenced otherwise.

For dairy cows, milk newcomers last, clean out feeders after milking and keep in a separate building until post movement testing has happened - if practical.

Anyone handling these cattle must wash off and disinfect during this period.

Effective disinfectants

FAM diluted at 1:20 should be used to clean boots, protective clothing etc to prevent fomite infection.

Preventative vaccine/prophylaxis

None available. Vaccine trials are underway in England, but programmes rolled out will be under statutory control.

Official control or accreditation scheme

TB is a notifiable disease, initially detected during routine herd and tracer skin testing (government), pre/ post movement testing (private) or slaughterhouse carcase surveillance.

Purchase advice

Request TB testing history from auction/direct from farmer. Go to www.ibtb.co.uk to look at TB outbreaks in geographical area from which you are considering purchase of cattle. Consult your vet about relative risks from TB testing history of the farms you are considering purchasing from and ask your vet to speak to the vendor's vet.

Important facts and advice for best practice biosecurity

- **Restrict contact between badgers and cattle**: Use barriers to prevent badgers getting into buildings and limit cattle access to badger latrine areas and setts.
- **Restrict contact between cattle and deer.**
- **Manage cattle feed and water**: Prevent wildlife access to feed stores, troughs, licks and water troughs. Don't feed cattle on the ground but use troughs that badgers cannot access. Pasteurise waste milk before feeding to calves.
- **Reduce risk from neighbouring herds**: Erect double fencing. Do not use mixed grazing with other holdings if possible. Don't use shared equipment/ personnel without cleaning and disinfecting between farms and check www.ibtb.co.uk regularly for local outbreaks.
- **Minimise infection from cattle manure**: Store for 6 months then spread on arable land/ grazing/ silage land at least 2 months before it is to be grazed/ensiled. Minimise aerosol and spread only on your own land.

For further information, see biosecurity advice at *www.tbhub.co.uk*.

Bovine Viral Diarrhoea (BVD)

Eradication, Scotland
Accredited rest of UK

Until test results known

Mode of transmission

Contact/aerosol

The main source of infectious virus is the secretions/excretions of persistently infected (PI) animals that were infected in the uterus – if they are removed from the herd, the disease will die out. Purchased animals must be tested to ensure that they are not PIs. Another mode of transmission is via contact with infected animals e.g. at markets or over-the-fence. Susceptible cattle that are infected shed infectious virus for 1-2 weeks after which the immune response controls the infection. This is called transient infection and these animals present a small risk of infection to other animals while they are shedding virus.

Diagnosis/Testing

Exposure to BVD, in previously infected or vaccinated animals, can be identified by testing for BVD-specific antibodies. Testing for BVD virus (by PCR or antigen ELISA) identifies infected animals. PI cattle will remain BVD virus-positive in subsequent tests repeated at least 4 weeks later, while transiently infected cattle will be virus-negative but antibody positive in a later test.

In Scotland: The Scottish Eradication Campaign requires annual testing for breeding herds. Animals PI with BVD virus can only move directly to slaughter. All keepers of non-breeding herds must test any calves for BVD virus within 40 days of birth.

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Quarantine time

A purchased animal coming into a breeding herd from an untested herd must be isolated and tested for BVD virus on arrival. The status of the receiving herd will change to 'not negative' until a negative test result has been received for the animal.

Quarantine conditions

Isolation, ideally in a separate building because all bodily secretions (saliva, urine, faeces, tears) may result in virus transmission through direct contact or aerosols.

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Effective disinfectants

Carrying infection from PI cattle via bedding, handlers' clothes/boots, or equipment is a real danger; therefore use of standard farm disinfectants at the correct dilution and correct disposal of bedding is essential for effective disease control.

Preventative vaccine/prophylaxis

Several vaccines are in use but their efficacy is dependent on strict adherence to their instructions for use. Because of the danger from infection of pregnant cattle leading to birth of PI offspring, breeding females should be vaccinated before AI or first service, according to the manufacturer's instructions. Booster vaccinations are essential.

Official control or accreditation scheme

Accreditation: Use a CHeCS registered scheme such as HiHealth (Biobest) or PCHS (SRUC).

Control: In Scotland, there is a nation-wide official BVDV eradication scheme: *www.gov.scot/Topics/farmingrural/Agriculture/animal-welfare/Diseases/disease/bvd.*

In Northern Ireland, BVDV eradication entered the compulsory phase on Ist March 2016 *www.animalhealthni.com/BVD.aspx.*

Recording: In Scotland, cattle BVDV test results from approved laboratories and the status of animals/holdings are available via the ScotEID database *www.scoteid.com/lookup.*

Purchase advice

Cattle should be purchased from accredited BVDV negative herds or animals that have been individually tested and have BVDV negative status. Any calves born to recently purchased stock, or in non-breeding herds should be tested within 40 days of birth.

Important facts and advice for best practice biosecurity

- Nose-to-nose contact over fences should be minimised – double fencing with a gap of at least 3m is advised.
- Sharing of equipment, including vehicles and trailers, should be kept to a minimum and these should be cleaned and disinfected before use with BVD-negative cattle.
- Animals that have been moved from linked premises, or have strayed off-farm, should be isolated and tested as for purchased cattle.
- All visitors should disinfect hands, clothing and equipment before coming into contact with at-risk animals, or when moving between groups of animals with different BVD status.

Infectious Bovine Rhinotracheitis (IBR)

Accreditation (CHeCS)

2 -3 weeks

Infectious bovine rhinotracheitis (IBR) is caused by bovine herpesvirus-1 (BoHV-1). As well as IBR, BoHV-1 can occasionally cause reproductive and severe neonatal disease and also predisposes cattle to other respiratory disease.

Mode of transmission

Aerosol/nose-to-nose contact. BoHV-1 is most commonly introduced following purchase of, or contact with, cattle excreting infectious virus. Most cattle only excrete large quantities of infectious virus in the two weeks following primary infection, but then have a life-long latent infection. This presents a risk to other cattle due to reactivation of virus excretion by stressful stimuli, such as transport, calving, poor nutrition or other diseases.

Diagnosis/Testing advised

If disease is present, nasal and ocular swabs should be collected for virus detection. Blood should be collected at the time of disease and three weeks later to test for serum antibody. A definitive diagnosis of IBR is best achieved if the appropriate clinical symptoms, virus and antibody detection are all demonstrated. However, for control purposes, individual animals can be tested for antibody. All antibody positive animals must be considered latently-infected carriers with the potential to infect other animals.

Quarantine time

All purchased or potentially infected animals should be quarantined until test results are known (usually 28 days). Serological testing at the start and end of quarantine can be used to determine whether an animal has been infected and is a latent virus carrier.

Quarantine conditions

Quarantined animals must be kept entirely isolated from other stock, including separate airspace. Any visitors should be provided with protective clothing and should not visit other stock after quarantine without disinfection of hands, boots, clothing and equipment.

Effective disinfectants

Most standard disinfectants/detergents can be used.

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Preventative vaccine/prophylaxis

- BoHV-1 vaccines are very good at preventing clinical disease and reducing virus spread, but they may not prevent field viruses from establishing a lifelong latent infection.
- Live attenuated vaccines are commonly used to protect cattle at risk and intranasal vaccines in the face of an outbreak can reduce clinical signs of disease.
- Calves can be vaccinated at 3-4 weeks but should be revaccinated at 3 months.
- Cattle older than 3 months can be protected by a single dose of live vaccine but 6-monthly vaccine boosters are needed to maintain protection.
- There is a range of marker vaccines available. These should be used so that vaccinated cattle can be distinguished from infected cattle by ELISA testing.

Is there an official control or accreditation scheme?

All existing schemes have accreditation via CHeCS *(www.checs.co.uk).*

Purchase advice

Only animals of an equal or higher IBR health status should be purchased. Quarantine rules should be followed.

Any other important facts/advice for best practice biosecurity?

- Risk factors for herds include: purchasing cattle; large herd size; presence of dairy cattle; high density of herds in the region; cattle participating in shows and professional visitors not wearing protective clothing.
- Nose-to-nose contact over fences should be minimised and double fencing with a gap of at least 3m is advised.
- Sharing of equipment, including vehicles and trailers, should be kept to a minimum and these should be cleaned and disinfected before use with IBR-negative cattle.
- Animals that have been moved from linked premises, or have strayed off-farm, should be quarantined and tested as for purchased cattle.
- All visitors should disinfect hands, clothing and equipment before coming into contact with at-risk animals, or when moving between groups of animals with different IBR status.

Leptospirosis

Accreditation (CHeCS)

Until test results are known

Disease in cattle caused by the group of bacteria collectively referred to as Leptospira Hardjo, which can cause reduction in milk yield, infertility, abortion in the second half of pregnancy and the birth of weak calves with lower-than-normal survival rates. It can also occasionally cause acute disease in young cattle. It is important to remember that this pathogen is zoonotic.

Mode of transmission

Urine, semen, and vertical transmission to the unborn calf.

Risk factors for leptospirosis

Use of bulls (especially those shared with other herds), co-grazing with sheep, buying in replacement cattle, access to natural water courses and ponds used by other farms.

Diagnosis/Testing advised

Ascertaining as much herd history as possible and testing animals on arrival is advisable, with blood antibody ELISA and urine PCR tests available. Note: antibody testing may give rise to some false negative results in infected animals; vaccinated animals may test positive.

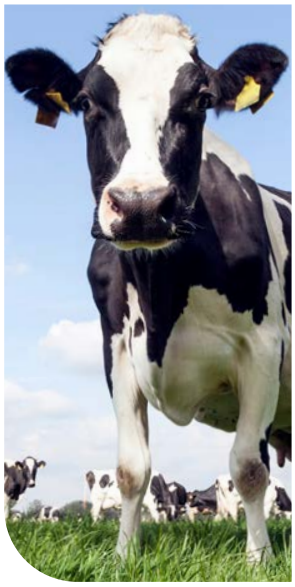
Quarantine time

All brought in animals should be isolated from the resident herd until test results are known.

Quarantine conditions

Vaccination of purchased animals is recommended where herd vaccination is carried out. If a non-vaccinated bought in animal tests positive on ELISA and/ or urine PCR then antibiotic treatment might be considered by your vet. Infected animals may excrete Leptospira bacteria for just a few weeks in their urine or may excrete continuously or intermittently for life.

Photo: www.shutterstock.com



Effective disinfectants
There are many effective disinfectants available – check product for efficacy, correct dilution, and application.

Preventative vaccine/prophylaxis
Initial vaccination course involves 2 injections 4 weeks apart, followed by annual booster injections. Vaccination will reduce urine bacterial shedding and will prevent milk drop and abortion. However, vaccination will not prevent infection in the herd.

Is there an official control or accreditation scheme?
There are various schemes available which are run to the CHeCS guidelines.

Purchase advice
Best practice would be to maintain a closed herd to avoid introducing potentially infected animals. If this is not possible, source replacements from accredited herds operating on CHeCS guidelines.

Any other important facts/advice for best practice biosecurity?
- Isolate aborted cattle immediately and investigate cause of abortion.
- Dispose of all products of abortion correctly (bury, burn, or collected).
- Fence off all surface water/streams/rivers and provide piped water wherever possible, as the bacteria also often pass into water courses from contaminated pasture where they can contaminate water sources.

Bovine neosporosis (*Neospora caninum* infection in cattle)

Accreditation (CHeCS)

Mode of transmission:
- Horizontal transmission – ingestion of *Neospora* oocysts that are shed in the faeces of acutely infected dogs.
- Vertical transmission – from an infected dam to the foetus through the placenta (predominant mode of transmission).

Neospora is not spread horizontally from infected to uninfected cows within a herd.

Diagnosis/Testing advised
Clinical signs are of little help as several other causes of bovine abortion may cause very similar scenarios. In the UK, it is a statutory requirement to report all bovine abortions.

Post-mortem (aborted foetuses)

These should be submitted with the placenta and a serum sample from the aborting dam. One or more of the following tests may be used:
- Immunohistochemistry (detection of the parasite in tissue section using specific antibodies).
- Molecular detection of parasite DNA in brain, heart, or placenta.
- Detection of specific antibodies against Neospora in the thoracoabdominal fluid of the foetus.
- Histopathology of aborted foetal tissues.

Live animals

Blood testing (Serology: detection of specific antibodies against Neospora in serum or plasma).

Quarantine time
Not applicable as animals infected with Neospora do not represent a herd health risk unless they abort in areas that dogs have access to, or they give birth to persistently infected female calves. If these persistently infected calves are retained, they will generate infected family lines by transmitting the parasite to their offspring, thereby keeping the infection within the herd.

Quarantine conditions
Not Applicable.

Effective disinfectants
Not Applicable.

Preventative vaccine/prophylaxis
There are no vaccines and no pharmacological treatments licensed for bovine neosporosis.

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Is there an official control or accreditation scheme?

Where there is a Neospora Risk Level Certification programme annual testing of female animals over the age of two years is required along with any breeding females over one year old. There are also mandatory elements of the control programme that must be followed within the scheme.

Purchase advice

- Neospora can be brought onto the farm through the purchase of persistently infected cattle.
- If buying replacement stock, purchase cattle from herds that are part of a Neospora accredited health scheme and have excellent reproductive performance history.
- Conduct blood sampling to check for antibodies to Neospora and repeat the test over the next two pregnancies to ensure that the replacement stock is Neospora negative.
- Bulls can be infected with Neospora but there is no evidence that Neospora can be transmitted by semen.

Any other important facts/advice for best practice biosecurity?

- Prevent dogs having access to cattle feed, calving areas, fields for the production of cattle forage and water sources for livestock.
- Safely dispose of afterbirths or other bovine tissue and control rodents on the farm as these can all pose a risk of Neospora infection if ingested by dogs.
- Be careful feeding raw meat to dogs due to the risk of the meat containing Neospora parasites. Tissue cysts of Neospora can survive for up to 2 weeks at 4°C and are killed by freezing.
- If your farm is close to public paths put up notices to inform dog walkers to pick up dog faeces to prevent potential contamination of farm areas.
- Prevent hunting on pastures used for breeding cattle.


cattle/
sheep

Cryptosporidiosis

Calves/lambs
2-3 weeks

Mode of transmission
Faecal-oral.

Diagnosis/Testing advised
Submit a faecal/scour sample to your vet for diagnosis to confirm cases and ensure that appropriate treatment, disinfectants and control strategies are used. Pen-side tests are available for rapid diagnosis on-farm.

Quarantine time
Remove scouring calves or lambs from the rest of the group and quarantine for at least 1 week after scouring stops.

Quarantine conditions
Quarantine away from other calves or lambs and feed using separate equipment and after feeding or handling healthy calves. Utensils should be thoroughly cleaned between use with hot water. Personnel should ensure cleaning and disinfection of boots and outer garments after handling scouring calves or lambs.

Effective disinfectants
Many standard farm disinfectants are NOT effective against Cryptosporidium. Those that have been tested at Moredun Research Institute and are effective are:

- 2-3% Keno™ Cox – kills 99% oocysts after 2 hrs contact time.
- 2-4% Neopredisan – kills 99% oocysts after 2 hrs contact time.
- 10% Ox-Virin – reduced oocyst infectivity after 1 hr contact time.
- 3% Hydrogen Peroxide – reduced oocyst infectivity after 4 mins.

Preventative vaccine/prophylaxis
- Currently there is no vaccine licensed in the UK.
- There are two active compounds licensed for treatment of Cryptosporidiosis: Halifugnoe and Paramomycin.
- Discuss with your vet the most appropriate treatment for your calves.
- Use diagnostics to ensure appropriate treatment.

Is there an official control or accreditation scheme?
No.

Purchase advice
Know your supplier and if you currently do not have a problem with Cryptosporidium, you do not want to buy it in. Therefore, if purchasing calves or lambs keep them separate from young resident livestock until you are sure they are not scouring (2-3 weeks).

Any other important facts/advice for best practice biosecurity?
- Good colostrum management – to reduce disease burden in calves.
- Steam clean animal pens – heat will kill the oocysts.
- Disinfect animal pen areas frequently to reduce oocyst build-up.
- Keep animals in 'age-groups' – do not mix older animals with younger ones.
- Slurry and manure should be well fermented or composted prior to application on pasture.

Gastro-intestinal Worms

Yard 48 hours post treatment and keep separate for 3 weeks

Mode of transmission
Oral via ingestion of contaminated herbage.

Diagnosis/Testing advised
Yes, faecal egg counts conducted on a proportion (10%) of quarantined stock 10-14 days after treatment.

Quarantine time
Sheep

- Yard all sheep (ewes, lambs and rams) on arrival for 48 hours.
- Treat ALL incoming animals with effective product to remove resistant worms and sheep scab.
- Turn out on to pasture that has carried sheep this season and keep isolated from resident stock for at least 3 weeks.

Cattle

Treat incoming animals with effective product and keep isolated from resident stock for at least 3 weeks.

Quarantine conditions
Keep brought in livestock separate from other farm stock until post-treatment test results are known.

Effective disinfectants
N/A.

Preventative vaccine/prophylaxis
Sheep

Sustainable Control of Parasites in Sheep (SCOPS) advice: On bringing in stock drench with a wormer from either the 4-AD (Zolvix®) and 5-SI (Startect®) groups with or without an effective scab treatment depending on perceived scab risk (*see important facts below). Test efficacy post-treatment.

Cattle

COWS advice: Treat with an effective anthelmintic, with 3-ML resistance reported it is sensible to use 2-LV (levamisole) or 1-BZ (benzimidazole). Test efficacy post-treatment.

Is there an official control or accreditation scheme?
No.

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Purchase advice
Ensure that administered quarantine treatments have worked.

Any other important facts/advice for best practice biosecurity?
- If sheep have, or will be given Footvax, product contraindication requires that the moxidectin 1% is replaced. Suitable products are either 2% moxidectin OR doramectin OR plunge dipping in an OP.
- Ensure dosing equipment is calibrated and working accurately.
- Measure weight of livestock to ensure correct dose administered.

Lungworm

48 hrs post anthelmintic treatment

Not protected for 6 weeks after 1st vaccine

Mode of transmission
Oral via ingestion with contaminated pasture.

Diagnosis/Testing advised
Faecal sample analysis, Baermannisation of samples for presence/absence of lungworm larvae OR milk/serum ELISA antibody test.

Quarantine time
- 48 hrs post broad-spectrum anthelmintic administration, check data sheet to ensure that treatment will be effective against all stages of lungworm.
- Vaccinated calves are not protected until two weeks after their second dose and as such should be protected from high challenge until this time point.

Quarantine conditions
Isolate for 48hours as with anthelmintic treatment for other round worm infections and monitor closely when turned-out on to pasture especially if the farm has a history of lungworm problems.

Effective disinfectants

Not applicable.

Preventative vaccine/prophylaxis

Anthelmintics

Most broad-spectrum anthelmintics are highly effective against all stages of lungworms but check data sheet prior to administration. See www.noahcompendium.co.uk or data sheet.

Live attenuated vaccine

- For preventative control in cattle, two doses of vaccine should be given at an interval of four weeks.
- If a vaccination program is implemented, all calves on farm should be done and the program needs to be continued annually for each calf crop.
- Calves are not protected until two weeks after their second dose and as such should be protected from high challenge until this time point.

Is there an official control or accreditation scheme?

No.

Purchase advice

Ensure that administered quarantine treatments have worked.

Any other important facts/advice for best practice biosecurity?

- Ensure dosing equipment is calibrated and working accurately.
- Measure weight of livestock to ensure correct dose administered.
- New stock, even older stock, may bring lungworm on to your farm OR equally may not have been exposed to lungworm previously.

Johne's Disease

Accreditation (CHeCS)

Until test results known

Sheep & goats.
Limited use cattle

Mode of transmission

Primarily faecal-oral, but also via contaminated colostrum and milk from infected dams, *in utero* and via contaminated semen.

Diagnosis/Testing advised

The diagnostic tests available and the type of testing advised can depend on the host species and the type of farm e.g. dairy or beef.

In sheep and goats:

- The cost of testing is high compared with the value of the animal.
- Not all sheep with Johne's disease will develop antibody responses and the commercial Johne's ELISA test is not optimised for this species.
- Sheep can be low shedders and can be infected with a strain type that would not be cultured using the automated liquid culture system currently used for commercial diagnosis of Johne's disease.
- Consequently, the options for diagnostic testing in sheep and goats are poor and probably not commercially viable.
- However, post mortem examination is advised for thin and culled ewes to pick up Johne's disease as early as possible on the farm.
- Vaccination is of use in reducing shedding and clinical disease if detected.

In cattle: Johne's disease is much easier to detect and the antibody ELISA is the most widely used diagnostic test for herds.

For beef cattle, annual testing with Johne's serum antibody ELISA and removal of test positive animals is recommended. Follow-up animals with an inconclusive test result using a complementary test such as faecal culture.

For dairy cattle there are different testing regimes using milk and/or serum antibody ELISAs. Consult CHeCS for details on these.

Photo: www.pixabay.com

Quarantine time

- The incubation time for disease is in excess of two years, so it is not practical to quarantine animals for this length of time.
- Quarantining animals until test results are available is recommended.
- It is sometimes necessary to quarantine test positive animals on a farm to prevent spread of disease. e.g. a test positive pregnant cow may be quarantined until the offspring is weaned and then both can be sold for slaughter. Heifers born to positive or inconclusive dams should not be retained for breeding.

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Quarantine conditions

- Accommodation and/or pasture separate from uninfected stock.
- Compost manure from the infected animals and avoid grazing stock (particularly young stock) on the same pasture for a minimum of a year after the animals are removed.
- Disinfect sheds where infected animals have been housed.

Effective disinfectants

Any disinfectant approved by DEFRA for control of bovine tuberculosis but ensure correct dilutions are applied. For example, FAM may be used on a farm to control a number of diseases but to be efficient against mycobacteria it needs to be used in a more concentrated form.

Preventative vaccine/prophylaxis:

Sheep and goats: A killed vaccine is available for sheep and goats and can be very effective in controlling Johne's disease in these species. It reduces clinical disease and shedding but does not prevent infection, therefore it should be remembered that vaccinated animals can be infected and a source of infection.

Cattle: A formulation is available for cattle but vaccination of cattle must be done with caution as it can interfere with statutory skin testing for bovine tuberculosis and it is not possible to differentiate between vaccinated and infected cattle. Vaccination in cattle is therefore reserved for very highly infected herds and then only for a period of time to reduce the prevalence in the herd.

Is there an official control or accreditation scheme?

Yes, for cattle but not for sheep and goats. There are a number of schemes regulated by the Cattle Health Certification Standards (CHeCS).

Purchase advice

- Ideally maintain a closed herd/flock or minimise the purchase of replacement breeding stock.
- Only buy from accredited herds or from farms where the absence of Johne's disease has been confirmed for the past 3-5 years.
- Where this is not possible and large numbers of replacements are required for rapid expansion, try to buy from a single herd and test the whole herd.
- As there are no Johne's assurance programmes for sheep, goats or deer in the UK, effective biosecurity cannot be achieved for these species if significant numbers of replacements are purchased.

Any other important facts/advice for best practice biosecurity?

Consider screening cull animals and poor yielders to try to detect Johne's disease at an early stage. Remember that the organism causing Johne's disease can pass between sheep and cattle so beware of buying in replacements of both species, test both species on the farm and be wary of co-grazing or sequential grazing. Wildlife such as deer and rabbits could potentially spread Johne's disease, therefore fence off wildlife and control rabbit populations on the farm.

Good hygiene of watering facilities is important and fields should be provided with water troughs where possible. Troughs indoors should be cleaned regularly or alternatively nipple drinkers provided. There are management procedures that can be employed to reduce the risk of transmission on the farm.

Liver Fluke (Fasciolosis)

3 weeks post treatment

Mode of transmission

Ingestion of infectious metacercarial cysts off pasture while grazing.

Diagnosis/Testing advised

- Fluke faecal egg count (FEC).
- Coproantigen ELISA (cELISA).
- Serum antibody ELISA (AbELISA) blood test for liver/bile duct enzymes (GGT/GLDH).

Use testing to prove there are no fluke there e.g., depending on the age, and origin of the animals, that could be a negative Ab result 3 weeks after arrival for lambs, or negative coproantigen result 6 weeks after arrival for adults with a risk of previous fluke exposure (must be kept indoors or on paddocks with no mud snail habitat between arrival and testing).

Quarantine time

Involves an effective flukicide treatment, not just isolation. After treatment, keep separate from resident livestock for at least 3 weeks (e.g., https://www.scops.org.uk/internal-parasites/liver-fluke/fluke-quarantine/).

Quarantine conditions

As above, keep indoors or on 'low risk' paddocks (with no mud snail habitat) for at least 3 weeks after an effective treatment, which for triclabendazole (TCBZ) resistant fluke is 2 closantel treatments 6 weeks apart.

Effective disinfectants
Not Applicable.

Preventative vaccine/prophylaxis
No vaccine available. There is a (small) range of flukicides available, with a spectrum of activity against fluke of different ages.

Is there an official control or accreditation scheme?
No.

Purchase advice
'Buyer beware'!

Any other important facts/advice for best practice biosecurity?
Don't bring fluke onto your farm or, worse still, resistant fluke! 'Test, don't guess', use testing to determine need to treat, best product to use and that it's worked!

See SCOPS & COWS websites for more information:

https://www.scops.org.uk/workspace/pdfs/effective-quarantine-and-treatments.pdf
https://www.cattleparasites.org.uk/app/uploads/2018/08/COWS-guide-to-managing-liver-fluke-in-brought-in-cattle1.pdf

Mastitis

For Staph aureus and Strep agalactie only
No specific time advised

Cattle only for E. coli and Staph aureus

Mode of transmission
Dairy:

- Contagious transmission from cow to cow in dairy farms of *Streptococcus agalactiae*, *Staphylococcus aureus* and *Mycoplasma spp.* during milking.
- Pathogens such as *Escherichia coli* are acquired from the environment. For other bacteria such as *Streptococcus uberis* both cow to cow contagious transmission and environmental transmission may occur.

Beef and sheep: Little is known about transmission in suckler cows and ewes.

Diagnosis/Testing advised
- Clinical inspection of the udder.
- Somatic cell count (SCC) testing on milk.
- Bacteriological analysis on milk.

Quarantine time
No specific time advised, purchased animals should be milked last in order to minimize the risk of spreading infection, until the cow shows two consecutive low SCC/negative bacteriological tests.

Quarantine conditions
Cows purchased should be kept in a separate paddock if possible and milked last.

Effective disinfectants
Many available both for post milking teat disinfection and disinfection of milking equipment and farm environment.

Preventative vaccine/prophylaxis:
Vaccine available in cattle only for *E. coli* and *S. aureus* but its efficacy in reducing the risk of infection is still a matter of debate.


Photo: www.shutterstock.com

Is there an official control or accreditation scheme?
There are no official control or accreditation schemes.

Any other important facts/advice for best practice biosecurity?
Correct milking routine and high standards of environmental hygiene should be maintained to minimize the risk of spreading mammary infections.

- Farms normally keep SCC data and record mastitis cases, therefore farm SCC data for the previous 6-12 months should be requested before purchasing animals.
- Animals should be purchased only from farms with low SCC.
- Purchase animals with a clear mastitis record and low SCC for at least 1 year (< 200,000 cells/ml).
- Heifers are significantly less likely to be infected than cows.
- Animals should be acquired from farms with no presence of contagious mastitis cases.

Tick-Borne Diseases

3 weeks

Treatment to control ticks (not the disease)

Mode of transmission

Tick bites.

Diagnosis/Testing advised

Louping Ill Virus (LIV)

- Individual/flock pre-movement or purchase test via serology to confirm previous exposure to LIV if animals are going to be grazed on un-improved, rough pastures.
- Individual serology can also confirm recent or historical exposure.
- Antigen test to confirm disease at post-mortem.

Tickborne fever

Individual antigen test on EDTA blood to confirm infection. Post-mortem test to confirm cause of death.

Babesia (cattle)

Antigen test on EDTA blood to confirm infection. Indicated over 6 months of age.

Quarantine time

- Quarantine and treat all incoming stock with acaricides whether newly purchased or returning from wintering or summer grazing – a 3-week quarantine will cover sheep scab, worms, and liver fluke as well.
- Practice good hygiene in sheds that have housed quarantined animals.
- Tick-borne diseases can be transmitted to humans.

Effective disinfectants

- Use DEFRA-approved disinfectants to decontaminate accommodations where sick animals have been housed.
- In case of abortion (tickborne fever) remove aborted lambs and placentas from the lambing pens and destroy them.

Preventative vaccine/prophylaxis

- No vaccine currently available. Research on a vaccine for LIV is at an advanced stage but is not yet commercially available.
- Adult sheep which have previously been exposed to LIV-infected ticks tend to be immune. Lambs of such ewes are protected for the first 2-3 months of life by colostral antibodies.
- Colostrum will not protect lambs/calves from Tickborne fever.
- Calves under 6 months of age are generally not susceptible to Red Water.
- Liaise with your vet to develop a working tick control plan for your individual farm and circumstances.

Is there an official control or accreditation scheme?

No.

Purchase advice

- If you lamb in-bye and later put lambs to the hill, remember they may not have been exposed to tick or LIV.
- Always obtain details on previous tick exposure from previous owner/grazier and use these to form a tick control plan with your vet.
- Tick-borne fever can induce temporary infertility in rams.

Any other important facts/advice for best practice biosecurity?

- Effective tick control is essential in high-risk areas to reduce tick numbers and hence tick-borne diseases and if aiming to reduce tick on other species.
- A high-risk area could be considered as one where the total tick burden on an untreated sheep is greater than 20 and LIV prevalence within the sheep flock is greater than 10%.
- Expose young lambs to ticks in the spring to ensure exposure to TBF while lambs are protected against LIV by antibodies present in colostrum.
- Weigh up the benefits of frequent acaricide treatment against the stress of gathering, e.g., is the hill high or low risk for tick/tick-borne diseases.

Q Fever

3-4 weeks for replacement animals

Coxevac® for goats and cattle in UK

Virkon® S

Mode of transmission

Primarily by inhaling the bacteria, *Coxiella burnetii*, on dust particles contaminated with animal birth products, faeces, or urine. Occasionally via contact through skin abrasions or rarely via tick bites.

Diagnosis/Testing

- Diagnosis is based on identification of *C. burnetii* in vaginal swabs, placenta and/or foetal tissues from cases of abortion or stillbirths in cattle, sheep, and goats by PCR (to detect bacterial DNA) or immunohistochemistry (to detect bacteria in tissues using specific antibodies).
- Exposure to the bacteria can be determined by measuring antibodies to the bacteria in blood samples. However, this may not indicate active infection as antibodies can persist after an infection is cleared. Q fever status at the farm level can be monitored through bulk milk-tank testing.
- All cases of Q fever in ruminant livestock are now reportable in the UK.

Quarantine time

Ideally maintain a closed flock or herd. If not possible, quarantine and observe replacements for three to four weeks before introduction.

Quarantine conditions

As infections are spread by aerosol, quarantined animals should not share the same airspace as other stock. Furthermore, care should be made to minimise generation of dust and aerosols from quarantined animals and their environments e.g., avoid changing soiled bedding on windy days, dampening down bedding prior to mucking out quarantine pens.

Effective disinfectants

Virkon® S is effective against *C. burnetii.* However, most common farm disinfectants are not effective.

Preventative vaccine/prophylaxis

Yes. Coxevac® (CEVA Animal Health) is a licensed vaccine for use in goats and cattle. It is also licensed for use in sheep in the EU and the EEA but not currently in the UK. The vaccine should be administered twice three weeks apart, ideally by 3 weeks prior to mating or artificial insemination. Booster vaccinations are required, annually for goats and every 9 months for cattle.

Is there an official control or accreditation scheme?

No.

Purchase advice

Best practice would be to maintain a closed flock/herd to avoid introducing potentially infected animals. If this is not possible, purchase from flocks/herds with records of excellent reproductive performances.

Photo: www.pixabay.com

Any other important facts/advice for best practice biosecurity?

- Investigate any abortion and stillbirths in ruminant livestock in consultation with your veterinary surgeon.
- Isolate aborted animals until discharges cease.
- Quickly remove all aborted and stillborn lambs, kids and calves, associated afterbirths and soiled bedding and dispose of appropriately, ideally by incineration.
- Q fever is a zoonotic disease, for which ruminant livestock are the primary source of infection. Symptoms of Q fever range from acute flu-like symptoms in humans to less common long-term illness persisting for more than six months. Infection during pregnancy can cause adverse effects on the foetus, including premature birth, low birth weight, or abortion. Therefore, good personal hygiene is important when handling ruminant livestock.

Further information on minimising the risk of Q fever infection can be found here:
https://www.gov.uk/government/publications/q-fever-good-practice-for-farmers

sheep

Photo: www.shutterstock.com

Caseous Lymphadenitis (CLA)

Flock/group basis

Until test results known

Low risk of infection

Mode of transmission

The most frequent mode of entry of CLA into a flock is through the introduction of infected animals. From these animals, CLA lesions that develop within the superficial lymph nodes (i.e. those lymph nodes that can be palpated during physical examination) may rupture and shed pus containing many millions of infectious organisms. Naïve animals may either be infected directly through contact with infected animals, or indirectly through exposure to contamination from their immediate environment. In all cases, the disease is most likely to spread when the CLA-causing organism gains entry to naïve animals through breaks in the skin.

Diagnosis/Testing advised

Physical palpation of superficial lymph nodes may allow identification of swellings indicative of CLA. This procedure is especially helpful when the flock history of CLA is understood. There are two commercially available diagnostic tests for CLA. Discuss with your vet which is the most applicable for your flock.

Quarantine time

CLA is a chronic disease which may take weeks to months to manifest. This makes it very difficult to define an optimal quarantine period. In addition, many animals with CLA develop internal lesions, which cannot be observed through physical examination, so these animals remain an infection risk for the future. The suggested approach would be to quarantine animals for as long as it takes to have blood-testing performed and rely on blood-test results rather than a defined quarantine period to inform as to the risk associated with new stock.

Quarantine conditions

Quarantined animals should be housed separately in such a way as they cannot come into direct contact with the rest of the flock. Accommodation should be thoroughly disinfected before returning the quarantine area back to general housing.

Effective disinfectants

Most common disinfectants appear to effectively kill the disease-causing organism, including calcium hypochlorite, formalin, and cresol solution. The presence of organic material (such as that associated with pus) may necessitate an increased exposure time to disinfectant.

Photo: www.unsplash.com

Preventative vaccine/prophylaxis

There is no licensed vaccine for CLA available in the UK. Autogenous vaccines may be made to order, and permission may be sought from the VMD for the importation of foreign CLA vaccines for emergency use.

Is there an official control or accreditation scheme?

There is no official control/accreditation scheme for CLA. SRUC operate a pre-sale screening programme through the Premium Sheep and Goat Health Scheme (PSGHS)

Purchase advice

Ask the seller about flock history of CLA. In addition, an understanding of whether the seller vaccinated against CLA is important since vaccination may give rise to positive blood-test results in the absence of infection.

Any other important facts/advice for best practice biosecurity?

CLA can be passed onto humans through contact of infected pus with wounds on the skin. It is therefore advised to wear disposable gloves when handling sheep suspected of or diagnosed with CLA.

Enzootic Abortion of Ewes (EAE)

Accreditation (SRUC)

On abortion

Risk to pregnant women

Photo: www.unsplash.com

Mode of transmission

Ingestion or inhalation from products of abortion/lambing, also can be transmitted in utero from mother to foetus.

Diagnosis/Testing advised

- Presumptive diagnosis through assessment of placenta and staining of placental smear with modified Ziehl-Neelsen.
- Confirm diagnosis by specific commercial ELISA or PCR.

Quarantine time

No need to quarantine replacement animals brought on to farm as the greatest risk of disease transmission occurs at lambing time. Following abortion isolate the ewe from other animals. Animals are generally considered infectious until vaginal discharges have dried up (isolate for at least 7-10 days).

Quarantine conditions

See above.

Effective disinfectants

Chlamydia are susceptible to most disinfectants (including FAM 30 and Virkon [1%]) and detergents, including a 1:1,000 dilution of quaternary ammonium compounds, 1% sodium hypochlorite, 70% ethanol, glutaraldehyde and formaldehyde. They are resistant to acids and alkali.

Preventative vaccine/prophylaxis

Two live attenuated vaccines and an inactivated vaccine are available. The live vaccines must not be administered during pregnancy or while the animal is being treated with antibiotics. The vaccines should be administered at least 4 weeks prior to mating. Antibiotics can be used at the start of an outbreak to reduce losses but should not be used routinely as a means of controlling infection.

Is there an official control or accreditation scheme?

PSGHS for EAE operated by Scotland's Rural College (SRUC).

Purchase advice

Purchase replacements from EAE-free accredited flocks (PSGHS).

Any other important facts/advice for best practice biosecurity?

Vaccinate replacements before introducing to a naive EAE-free flock. Caution should be taken to reduce risks of transmission to humans by careful handling of potentially infected live or dead lambs, products of abortion and vaginal excretions. Pregnant women and immunocompromised individuals should not be involved in lambing to reduce risks of transmission. If you have been in contact with ewes/lambs during the lambing period and feel unwell with flu-like symptoms, seek prompt medical advice.

Maedi-Visna (MV)

Accreditation (SRUC)

6 months
(2 negative blood tests)

Mode of transmission

The virus is transmitted by close contact and frequently via the oral route (via ingestion of infected colostrum/milk, contaminated water, or feed), or by respiratory and ocular routes, or via contaminated equipment. Most transmissions appear to occur at housing.

Diagnosis/Testing

MV is a slowly developing and spreading disease caused by the MV virus. Individual animals usually show signs of disease over two years of age and more normally aged four to five years. Most commonly sheep show weight loss and problems breathing. Increased mastitis rates and hind limb paralysis are further signs. Within a flock, signs of disease may not be noticed until ten years after introduction. Decreased production efficiency and increased mortality are common signs.

This disease is most commonly diagnosed using a blood serum ELISA test to detect antibody against the MV virus. This test is used as a flock screening test. It can also be used as a quarantine test for individual sheep over a year old, with repeat testing six months later.

Quarantine time

Maintain in isolation until quarantine blood test results come back. Because of the long incubation period of this disease, quarantine advice is to maintain in isolation for six months until re-test is clear. In commercial situations this may not be possible. However, it is important to continue to observe closely for any signs of disease during this time. Repeat blood test six months later.

Sheep from MV Accredited flocks can be introduced into the flock without quarantine or testing for MV, however standard quarantine times and quarantine testing for other diseases will apply.

Quarantine conditions

Keep separate from other sheep: no nose-to-nose contact or drainage into pens containing other sheep. Avoid sharing a common air space with other sheep. Do not share equipment (for example drenching or injection) with other sheep.

Effective disinfectants

The best advice is to check the individual product label before use and ensure that it is effective against MV virus. A couple of examples which can be used are Virkon® S and Blitz® but other products are available.

Preventative vaccine/prophylaxis

No vaccine or treatment is currently available.

Is there an official control or accreditation scheme?

The SRUC operate a Maedi Visna (MV)/Caprine Arthritis Encephalitis (CAE) Accreditation Scheme. This is open to sheep and goat keepers. To become members of this scheme flocks need to have two initial clear qualifying tests between six and twelve months apart and then annual accreditation tests.

Purchase advice

- The lowest risk purchases are from MV Accredited flocks.
- If accredited sheep are not available, the risk of buying in MV disease can be reduced by pre-purchase or quarantine testing purchased sheep for MV and then repeating this test six months later. This testing is only effective in sheep over a year old.
- Reduce risk by purchasing as few sheep as possible and from known and trusted sources.
- Remember this disease has a long incubation period so monitor purchased sheep carefully in the six months post purchase.

Photo: www.unsplash.com

Any other important facts/advice for best practice biosecurity?

- Once introduced to a flock MV can spread without being recognised and be well established before it is diagnosed.
- Monitor flock performance and investigate decreasing production efficiency, increased numbers of thin ewes, lambs not thriving, decreased milk yield or decreased fertility.
- Keeping ewes of different age-groups in separate pens when housed could reduce transmission of the virus.
- Different laboratories may offer packages to blood test thin ewes for MV to enable early detection of disease in a flock.

Remember goats! Goats can be infected with the CAE virus which is closely related to the MV virus and cross infection between goats and sheep can occur. It is therefore very important if you have goats on your farm to include testing goats in any quarantine testing, accreditation scheme or clinical screening.

Orf

Confirmatory only

2-6 weeks

Live vaccine

Mode of transmission
Entry of virus through broken skin.

Diagnosis/Testing advised
Only as confirmatory.

Quarantine time
Ideally 6 weeks (if showing signs) or shorter if no signs appear within two weeks. However, there is some evidence that apparently asymptomatic sheep can lead to outbreaks of disease. This may be due to carrying infectious fomites in the fleece or carriage of virus in the tonsils of previously infected animals.

Quarantine conditions
Any DEFRA approved disinfectant (including FAM 30 and Virkon®). The presence of organic material (such as that associated with scabs) may necessitate an increased exposure time to disinfectant..

Effective disinfectants
FAM/Trigene/Steam cleaning.

Preventative vaccine/prophylaxis
Vaccine available, but it is a virulent virus which can lead to disease outbreaks therefore not recommended for use in a situation where the farmer has never had a problem with orf in the past. Follow strict vaccination guidelines for application, as recommended by the vaccine manufacture.

Is there an official control or accreditation scheme?
No.

Purchase advice
Check for obvious lesions around the face, especially the mouth and nostrils and also around the genital area and on the head. Ask for the vaccination history.

Any other important facts/advice for best practice biosecurity?
- Never use the vaccine unless there has been a history of orf on the farm.
- If using the vaccine, ensure lambing sheds, feeding troughs, hard surfaces such as gates and fence posts are fully disinfected prior to re-use/next lambing season.
- If infected animals have used a particular pasture/paddock, leave unused for a season before re-introducing susceptible animal if possible.
- The virus only infects through broken skin, therefore, if possible, manage the pasture to ensure thistles/rough grazing is kept to a minimum.
- Avoid situations where infected animals are likely to suffer stress, e.g., overcrowding in sheds or removing infected lambs from their mothers, as this is likely to exacerbate disease.

Photo: www.unsplash.com

Ovine Pulmonary Adenocarcinoma (OPA or Jaagsiekte)

FAM, Virkon®

Mode of transmission
Respiratory (also in milk/colostrum).

Diagnosis/Testing advised
- There are no commercially available diagnostic tests.
- A diagnostic blood test was developed by researchers but is useful as a flock test and not for individual animals.
- Diagnosis of OPA is therefore from clinical signs alone.
- Gold standard diagnosis is post-mortem histological examination of lung lesions.
- Transthoracic ultrasound can detect OPA tumours greater than 2cm in diameter on the ventral surface of the lung.

Photo: www.shutterstock.com

Quarantine time and conditions
For OPA it is difficult to quantify quarantine time due to the nature of the disease. Keep bought in sheep separate from the rest of the flock for as long as is practically possible and observe for signs of OPA.

Effective disinfectants
FAM, Virkon®.

Preventative vaccine/prophylaxis
None available.

Is there an official control or accreditation scheme?
No.

Purchase advice
Ultrasound scanning may be useful to screen out advanced cases of OPA in new purchases, but a negative ultrasound result should not be interpreted as a confirmation that the animal is free of OPA.

Sheep scab (Psoroptic mange)

Notifiable, Scotland

2 weeks minimum

Mode of transmission:
- The sheep scab mite is usually transmitted by direct contact between animals. However, as mites can survive off host for 16-19 days and infested animals seek relief by scratching and rubbing on fence posts, trees, bushes, gates, farm equipment etc., these are also a source of infection.
- Scab can be introduced from neighbouring flocks, the introduction of new stock, animals returning from wintering or shows, and this has implications for treatment, quarantine, and biosecurity.
- Sheep trailers, handlers, scanning equipment, etc. can all be potential sources of infection if not properly disinfected between farms/flocks. Protective clothing must also be disinfected and exposed areas of skin washed with hot water before leaving the premises.
- Good quality fencing, ideally in two parallel lines 1m apart, will control the introduction of scab mites by preventing contact with neighbouring flocks – one of the greatest transmission risks. A cheaper alternative is to use mobile electric netting as a second barrier across high-risk boundaries.

Diagnosis/Testing advised
- Scratching and rubbing may indicate sheep scab, but these signs can also indicate a chewing lice infestation.
- Flock owners should bear in mind that sheep may be infected with more than one ectoparasite (e.g., scab and lice) at the same time and accurate identification of the cause of disease through consultation with a vet is critical in definitive diagnosis and selection of an appropriate treatment.
- This involves a veterinary examination for clinical signs along with skin scrapings taken at the lesion edge for microscopic examination for the presence of sheep scab mites. However, this method is heavily reliant on operator experience and the presentation of an obvious lesion, and as such, the accuracy of diagnosis can be as low as 18%.


Photo: www.shutterstock.com

- Moredun has developed a blood test which detects antibodies to a protein found only in the sheep scab mite. The test can detect the presence of mites within 2 weeks of infestation and before the onset of clinical symptoms, which is important to effectively control the parasite. It is recommended to be used at the flock or management group level, with a minimum of 12 animals being tested from each flock/group.
- The Moredun ELISA test is available commercially and is offered as a diagnostic service through Biobest Laboratories Ltd (https://biobest.co.uk) and the Wales Veterinary Science Centre (WVSC) (https://www.wvsc.wales).
- It is crucial that all infested animals are identified, including subclinical cases. If you suspect sheep scab on even one animal, consider the whole group to be infested. Some animals can carry significant numbers of parasites without presenting with obvious clinical signs.
- In Scotland, vets supplied by SRUC provide free ectoparasitic examinations of skin scrapings taken from sheep.

Quarantine time

Antibodies against scab mite can take 2 weeks after exposure to become detectable by the ELISA test. Therefore, separate newly acquired sheep for at least 2 weeks before mixing with the main flock and observe for signs of infestation (nibbling, rubbing, scratching, deranged wool, areas of wool loss, etc.).

If sheep scab is suspected, seek advice from your vet with regards to treatment. SCOPS provide excellent advice on current best practice for quarantining new stock.

Quarantine conditions

Areas must be secured to ensure that quarantined sheep have no contact with other animals. If a group of quarantined sheep was shown to be infested with sheep scab and consequently treated, the empty quarantine area must be disinfected and left for a minimum of 19 days before introducing new sheep.

Effective disinfectants

All equipment in contact with sheep, including vehicles and trailers, must be cleaned and disinfected after use. It is not necessary to disinfect vehicles and trailers with a product approved for animal treatment. There are many conventional disinfectants that effectively kill mites and lice but cannot be applied to live sheep (e.g., Chloros or Virkon®).

Preventative vaccine/prophylaxis

Not available to date, but Moredun is developing a sheep scab vaccine for use in the future.

Is there an official control or accreditation scheme?

- Sheep scab is notifiable within Scotland (not the rest of the UK) and is covered by the Sheep Scab Order (Scotland) 2010.
- If sheep scab is suspected then (following notification of the Divisional Veterinary Manager if in Scotland), animals should be examined by a vet who will professionally identify the parasite and advise on the correct course of treatment.

Purchase advice

Assume that all bought in sheep, regardless of the farm of origin, could be carrying sheep scab mites. The same applies to animals returning from shared/common grazing and overwintering. If sheep are purchased from an environment that is high risk for scab, e.g., a mart, where mixing and contact with other sheep is unavoidable, quarantine them as above and carry out an ELISA test.

If the ELISA test is negative for scab, the bought-in sheep can be introduced to the rest of the flock. If the ELISA test is positive, they should be treated using an effective compound and given sufficient time for the treatment to take hold before being mixed with the rest of the flock.

Treatment advice

- If possible, ensure that the treatment selected offers residual protection against re-infestation for at least 16 days. Quarantined sheep must not be released into the main flock until treatment is completed and shown to be effective.
- If you choose to treat with a compound that does not offer protection against re-infestation, then it is crucial that animals are immediately moved to clean pasture to prevent re-infestation from mites in the environment.
- Sheep scab mites resistant to the macrocyclic lactone (ML) injectables have been identified in the UK, as such it is important that these drugs are used effectively, carefully following the manufacturer's instructions. This should include weighing animals when possible, to ensure the correct dose is given and that the drug is administered via the correct route and that all animals are treated.

Ovine Toxoplasmosis

(abortion due to *Toxoplasma gondii* infection in sheep)

Risk to pregnant women

Mode of transmission

- Horizontal transmission – ingestion of *T. gondii* oocysts that are shed in the faeces of acutely infected cats (usually kittens), generally via environmental, food or water contamination.
- Vertical transmission – from an infected ewe to the foetus through the placenta, resulting in abortion or an infected lamb.
- Reactivation of the parasite during pregnancy is rare.

Diagnosis/Testing advised

For persistently infected sheep.

Live sheep

Serological testing, either by ELISA or IFAT will determine if the sheep has been infected with *T. gondii*. However, presence of antibodies alone is not sufficient to indicate cause of abortion.

Abortions

- Pathological examination and detection of lesions in the placenta, brain, or heart of the aborted foetus.
- Immunohistochemistry (IHC): Use of anti-Toxoplasma specific antisera on tissue blocks helps with the species identification/verification of the pathogen causing lesions.
- Molecular tests, i.e., PCR, will confirm presence of *T. gondii* in foetal tissues/placenta but without pathological examination the test will not show that the parasite was the cause of the abortion.

Clinical observations

- These are usually not specific enough because abortions could be due to other causes i.e., Chlamydia (EAE) or other reasons.
- Abortions usually occur in the last trimester but before abortions due to Chlamydia (EAE).

Quarantine time

Not applicable because no sheep-to-sheep transmission occurs and once infected, sheep do not abort in subsequent pregnancies, even when re-infected.

Quarantine conditions

Not applicable.

Effective disinfectants

Not applicable.

Preventative vaccine/prophylaxis

Vaccine

- Toxovax® is a live attenuated vaccine.
- It is effective and protects against abortions for at least 18 months without natural challenge.
- The vaccine needs to be given at least 3 weeks before tupping.
- Usually, only replacement stock is vaccinated.

The vaccine has a relatively short shelf life.

Prophylaxis

There are drugs that can be used to help prevent Toxoplasma abortion in pregnant sheep, but the drug needs to be administered for several weeks during pregnancy and therefore is not often used.

Is there an official control or accreditation scheme?

No.

Photo: www.shutterstock.com

Purchase advice

If you buy either vaccinated or persistently infected ewes, then there is no risk for subsequent abortions due to Toxoplasma infection.

Any other important facts/advice for best practice biosecurity?

- Vaccination of replacement stock before mating is the best approach to reduce the risk for abortions due to Toxoplasma infection.
- Having healthy and neutered cats on the farm will also reduce the exposure to Toxoplasma oocysts. This means that no kittens are born on the farm and as a result no Toxoplasma.
- Keep feed bins covered and limit access of cats to hay sheds to prevent feeding becoming contaminated with faeces (which may contain Toxoplasma oocysts).
- *T. gondii* parasites may also be a risk to pregnant women and immunocompromised individuals.

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