

Sheep Scab

Sheep scab is caused by the sheep mite *Psoroptes ovis* and causes intense scratching, skin damage and wool loss. It is highly contagious and spread by direct contact between sheep, or indirectly by wool left on fences, trailers or by people. It can survive for up to 17 days off sheep making spread very easy. Scab is now a notifiable disease again, any animals suspected of having the disease should be examined, and skin scrapes taken for diagnosis. Appropriate treatment should be discussed with the vet and involves either dipping or injectable group 3 wormers, some require two injections to complete the course. Prevention involves having secure farm boundaries, avoiding sharing equipment with other farms and quarantining and treating any bought in stock before mixing with the rest of the flock.

Johnes

Johnes disease is caused by the bacteria *Mycobacterium avium* subsp. *paratuberculosis*. It is spread in the dung of infected animals and can survive on pasture for up to a year. Lambs are infected when young via faecal contamination of the environment, via colostrum or occasionally in the womb. Goats are also a source of infection, cattle to a lesser extent. Clinical signs of the disease are not apparent typically till sheep are aged 3-4 years old. Chronic weight loss and wasting are the main signs, affected sheep have poor, open fleeces but remain bright and do not tend to scour. There is no treatment for Johnes disease. Affected sheep should be culled and any offspring not kept for breeding purposes. There is a blood test available for diagnosis and a vaccine for flocks where there is a high incidence of disease.

Orf

Orf is caused by a parapoxvirus and is mostly seen on lambs around the mouth but also around the horns and at the top of the hoof. It can be spread by carrier animals without obvious skin lesions, and often flares up 2 weeks after movement to rough, stubbly grazing which causes superficial trauma to the lips allowing the virus to enter. The scabs on affected animals skin are also a source of infection for other sheep. Ewes with lesions on their teats can spread disease to their lambs. There is no effective treatment for the disease, antibiotic spray and injections for 1 week may be beneficial. Injectable levamisole may also be of benefit. Emollient cream can be applied to very raw, sore areas of skin. Gloves should be worn when handling such sheep as orf can be spread to humans. A vaccine is available and should only be used in flocks where the disease is a problem. Lambs can be done from birth with a skin "scratch" applied to the inner thigh. Ewes can be treated pre lambing also if need be, at least 7 weeks pre lambing.

Maedi Visna (MV)

MV is an infectious viral disease of sheep and results in different forms of disease. It is spread mainly from ewes to lambs via colostrum, but can be spread via nasal discharge especially if animals are in close contact e.g. trough feeding. Affected animals are usually 3 years old or over before clinical signs are seen.

Maedi causes respiratory disease, wasting and often arthritis and mastitis as well. Ewes struggle to breathe, especially when gathered and lag behind the rest of the flock. Affected ewes can also have a flabby udder and decreased milk production.

Visna causes nervous signs, either in the brain or the spinal column such as circling or reduced reflexes in one hindlimb leading to paralysis.

There is no treatment and affected sheep should be culled. Any offspring of affected sheep should also not be retained for breeding. As there is a long incubation period before clinical signs of the disease become apparent, unfortunately the disease may be well established in a flock before a diagnosis is made. Blood sampling can be undertaken, the SRUC Sheep and Goat Health Scheme has a MV test which allows flocks to establish accredited free status. Ideally if any bought stock are to be purchased, these flocks are a good way of minimising the chances of introducing the disease into your own flock.

Jaagsiekte

Jaagsiekte or OPA is a viral disease causing tumours in the lungs of affected sheep. It is spread by nasal discharges from affected animals, especially from ewes to newborn lambs and where there is close contact e.g. trough feeding, mineral licks. It can be spread via colostrum also. Most sheep are aged 2-4 years before clinical signs of disease are seen though occasionally it has been diagnosed in lambs under one year old. Affected animals lose weight and have respiratory signs; panting, increased breathing rate and tend to lag behind especially at gathering. A clear nasal discharge is sometimes visible when the head is lowered. Diagnosis is difficult, ultrasound scanning of the chest can be undertaken to try and detect tumours. "Wheelbarrowing" of affected animals by raising the hindlimbs and lowering the head of the animal may result in a clear nasal discharge which is positive for diagnosis. There is no treatment for this disease and affected animals should be culled. Any offspring should not be retained for breeding.

Lameness

Lameness is a huge economic and welfare problem in the sheep industry. Footrot alone equates to a £6 loss per ewe per year. Scald, Footrot and Contagious Digital Dermatitis (CODD) are the three most common causes of lameness.

Scald is common in lambs and is often due to wet starchy ground conditions. It causes redness between the digits but no damage to the hoof wall. Spraying with oxytetracycline spray should resolve this.

Footrot is caused by *Fusobacterium necrophorum* and *Dichelobacter nodosus*. It causes significant lameness and welfare concerns and as a result reduced weight gain, poorer wool quality and reduced reproductive performance. Warm wet conditions favour the spread of this disease. It causes inflammation and redness in between the digits with a foul smell and often a whitish discharge. The hoof wall is affected, mostly along the inner wall but can often spread up to the heel and outer wall

also. It causes a lot of pain to affected sheep. Treatment involves antibiotic injection and spray as well as regular footbathing which will help reduce spread. Vaccination is also beneficial to help improve ewes immunity to the disease and lower the challenge and spread of the disease.

CODD

This is a highly contagious and extremely painful disease of sheep caused by a spirochete similar to that which causes digital dermatitis in cattle. It causes severe lameness, typically of one foot and is a serious welfare concern in affected flocks. It starts at the coronary band of the foot and works down the hoof wall to the toe. Often the whole hoof capsule will come off. Affected animals must be injected with a long acting antibiotic and spray. Good quarantine procedures should be applied to prevent the disease being introduced into the flock.

The target of 2% or less in a flock can be achieved by following the five point plan as described below:

- 1) Cull – Removing the worst offenders will reduce the spread of disease through the flock. Ewes treated for lameness should be marked, any treated more than twice should be culled.
- 2) Quarantine – minimising the challenge being introduced to the flock by incoming animals. All should have their feet checked, footbathed and made part of the vaccination policy.
- 3) Treat – prompt treatment of affected animals will relieve pain quickly for affected animals as well as reduce spread to other sheep.
- 4) Avoid – improve underfoot conditions to help minimise spread especially in areas where sheep are handled regularly e.g. handling pens, footbaths.
- 5) Vaccinate – build immunity in breeding stock. Initially twice per year at high risk times e.g. housing, late summer.

Abortions

The two main infectious causes of abortion in sheep are Enzootic abortion and Toxoplasmosis. Both can be transmitted to humans so pregnant women should not handle sheep especially around lambing time.

Enzootic abortion

This is caused by a bacterium called Chlamydia abortus. It invades the placenta after 90 days of pregnancy and causes abortion in the last 2-3 weeks of gestation. It is spread between ewes via aborted lambs and cleansings, as well as vaginal discharge from ewes that have aborted for up to a week. Ewes infected less than 6 weeks before lambing will incubate the disease and not abort till the following year. Lambs born to infected ewes or twinned onto them may pick up infection and abort in their first pregnancy. Ewes that abort remain immune for life and will not abort again due to this disease. Diagnosis is made from smears taken from aborted lambs and ideally placenta. Bloods can be taken to detect antibodies to the disease. Some drug companies offer a subsidised Flock Check

Scheme whereby 6 ewes can be blood tested in the summer after lambing to look for exposure to the disease. There is no effective treatment but during an abortion storm injecting ewes with long acting oxytetracycline may be beneficial. Isolating any aborted ewes as well as removing any aborted lambs/cleavings will help reduce spread. Prevention involves avoiding buying in ewes where possible as carrier animals may spread disease. There are health schemes available for accredited EAE free flocks. There are several vaccines available, the most commonly used ones are a live vaccine and must be given at least 4 weeks prior to tupping. One vaccination should last a lifetime.

Toxoplasmosis

Toxoplasma gondii is a protozoan parasite spread by cats in their faeces. These oocysts can survive for many years in the environment and are ingested by sheep grazing contaminated pasture, feed or water. Toxo can cause early embryo loss resulting in a high barren rate, irregular returns to service in ewes, abortions of weakly live lambs or mummified lambs. The placenta has a classic appearance with large, red engorged buttons (cotyledons) with white speckles. Ewes that have aborted due to Toxo develop immunity to the disease and should be retained for breeding as they should not abort due to this disease again. Diagnosis is by post mortem examination of aborted lambs and cleavings. Flock check bloods as previously discussed can be taken in the months after lambing which may indicate previous exposure. Prevention is by ensuring there is no access to feed bins by cats and by worming any farm cats regularly, especially young ones. A live vaccine is available which must be given at least 3 weeks prior to lambing and provides good protection. It may need repeated every 3 years however it appears a single vaccination provides lifelong immunity. Decoquinate, an anticoccidiostat, can be fed to pregnant sheep from mid gestation and may help reduce lamb losses also.

Trace Elements

The main three trace elements are Copper, Cobalt and Selenium.

Copper

Copper deficiency occurs commonly in this area on upland/hill ground often as a result of other minerals in the soil such as iron, molybdenum and sulphur acting as antagonists. Ewes that are copper deficient mid pregnancy will produce lambs suffering from swayback. Lambs can be born with this and cannot stand or raise themselves to suckle. Such lambs should be euthanased. In the delayed form affected lambs 2-4 months show signs of progressive weakness and hindlimb lameness especially when being gathered. Supplementation of these lambs with copper is usually ineffective also. Acquired copper deficiency in growing lambs results in poor fleece quality with loss of natural crimp, sometimes called "steely wool", ill thrift and anaemia and these lambs are more susceptible to infection as well. Diagnosis is by blood sampling or liver levels are the gold standard as copper is stored here in the body. Supplementation is either by drenching, bolusing or injection. Copper toxicity must always be considered if long acting supplementation is used such as bolusing. It is important that there is no access to any further copper. Some breeds of sheep are more susceptible to toxicity e.g. Texels and Suffolks.

Cobalt

Cobalt deficiency is common where there are low soil concentrations. High worm burdens can also affect absorption of cobalt/vitamin B12 as well. Clinical signs are most often seen in growing lambs after weaning and include poor growth, open white fleeces and poor appetite. These lambs are more susceptible to other diseases such as pasteurilla pneumonia and clostridial disease. Diagnosis can be made by blood samples or liver samples. Treatment involves either regular drenching or boluses for longer supplementation.

Selenium

Selenium deficiency results in “white muscle” disease. Lambs can be born deficient if ewes are low themselves in selenium. These lambs are weakly and die soon after birth. Stillbirths are also common. Rapidly growing lambs 2-6 weeks old such as Texels or Suffolks are most susceptible. They have sudden onset stiffness, reluctance to move and within a couple of days cannot stand. In ewes selenium deficiency can result in poorer fertility and early embryonic loss of lambs leading to a higher barren rate. Diagnosis is by clinical examination and/or post mortem examination. Blood samples can also be taken to assess levels. Prevention is by providing a diet adequate in selenium. At risk newborn lambs can be injected with selenium at birth. In growing lambs regular drenching can provide adequate selenium for 1-3 months. Care must be taken as selenium toxicity can occur following overdosage. Boluses can be used in ewes.

Clostridial Diseases

Clostridial diseases are a serious threat to unvaccinated sheep. The bacteria are found in the soil so any disturbance such as draining or ditching can lead to outbreaks of disease. Change in diet, wounds and fluke damage can predispose to disease also. The majority of cases of clostridial disease result in rapid death. There are various vaccines available each covering different strains of the bacteria. The one most suitable for your flocks needs should be discussed with the vet. Most of the vaccines require two doses initially 4-6 weeks apart followed by an annual booster. Some of these vaccines also contain a Pasteurella pneumonia vaccine as well. Ewes are boosted 4-6 weeks prior to lambing to provide antibodies in the colostrum for their lambs. Lambs born to vaccinated ewes can be vaccinated themselves from 3-4 months old, lambs born to unvaccinated mothers can be vaccinated from 3 weeks old. Tups should be included in any vaccination plan. Some of the most common clostridial diseases are listed below:

- 1) Lamb dysentery – occurs in lambs born to unvaccinated ewes or lambs which have not received adequate colostrum. Lambs are typically less than 1 week old, later older lambs are affected. Lambs are weak, dehydrated, gaunt and terminally have scour. There is no treatment and death occurs within hours.
- 2) Pulpy kidney – usually occurs in 4-10 week old lambs born to unvaccinated ewes and in weaned lambs after antibodies from their mothers have waned. Sudden death is the usual finding, diagnosis is made by post mortem examination.
- 3) Braxy – typically seen in unvaccinated lambs in winter after eating frosted root crops. Sheep are found dead.

- 4) Black Disease – this is associated with immature fluke damaging the liver in late summer/early autumn and can affect unvaccinated sheep of all ages. Again typically sheep are found dead.
- 5) Blackleg – the bacteria enters through wounds such as dog bites, tail docking, untreated navels, shearing wounds, dirty needles or tears in ewes damaged when lambing. Occasionally affected animals are found alive with sudden onset lameness and stiffness of one leg with marked swelling and crepitus leading to a “bubble wrap” feeling over the skin. Dead follows rapidly.
- 6) Malignant Oedema – otherwise known as “bighead” often seen in the autumn when tups have been fighting. The result is a markedly swollen head especially around the eyes. This disease responds well to antibiotic therapy.
- 7) Tetanus – often occurs in lambs 4-6 weeks old after tail docking or castration entering through skin wounds. Affected lambs show stiffness, difficulty walking eventually leading to inability to stand, seizures and death.

Parasites – Worms and Fluke

Worms

Worms are probably the most important condition affecting flock production and performance. Ongoing issues with wormer resistance makes this a worthwhile topic to discuss with your vet to create an appropriate worming strategy for your flock. The three main infections are Nematodirus in young lambs in late spring, parasitic gastroenteritis of growing lambs mid summer onwards and adult sheep when appropriate measures are not carried out correctly.

Nematodirus can cause sudden death and scour in young lambs grazing pasture which has been contaminated with large numbers of larvae which hatch from eggs left on the pasture from lambs grazed here in the previous spring. It can cause high losses in lambs, ewes are not affected. Affected lambs that survive show marked weight loss. Worm egg counts are not always beneficial for this type of worm as often the lambs have a high challenge with larvae and adult worms before they are producing detectable eggs in the faeces. Prevention involves not grazing lambs on infected pasture where possible and the use of group one white drenches at the at risk period. NADIS provides forecasts each year as to when the risk period is likely to be, weather affects the timing of when the nematodirus eggs hatch (they require a period of cold followed by a temperature over 10 degrees for a period of 10 days before they will hatch, often resulting in large numbers appearing at once).

In growing lambs worm burdens typically result in scour, weight loss and anaemia in some cases. Faecal egg counts are of benefit and can help to assess what the worm burden is and when to dose. We can perform them in house using our FecPak system and deliver results and advice quickly. The three main types of worms seen in growing lambs are:

Teladorsagia – results in profuse scour, decreased weight gain.

Haemonchosis – this is a blood sucking worm resulting in anaemia, weakness, increased breathing rate and sometimes the accumulation of fluid under the chin (“bottle jaw”). It does not typically cause scour and is most often seen in summer.

Trichostrongylosis – usually seen in the autumn/early winter affecting 8-10 month old lambs sometimes called the “black scour worm” as it results in a dark foul smelling scour as well poor condition and weight loss.

Tapeworm, although readily visible in segments passed in sheep faeces, is not in general a concern and does not cause disease in sheep. Group one white wormers or group two yellow wormers combined with praziquantel are an effective treatment for tapeworm in sheep. Occasionally one species of tapeworm which is spread in dog faeces and ingested by sheep can cause the disease “Gid” forming cysts on the brain resulting in nervous signs. Proper worming of dogs prevents this disease.

Treatment for worms involves the five groups of wormers currently available:

Group 1 WHITE Benzimidazoles, probenzimidazoles

Group 2 YELLOW Imidazothiazoles

Group 3 CLEAR avermectins, milbemycin

Group 4 ORANGE monepantel

Group 5 PURPLE derquantel and abamectin

Advice on which wormer to use when and on what stock should be sought from the vet and incorporated into your flock health plan. It is essential that a proportion of the lambs are weighed, that dosing equipment is properly calibrated and that treatment is based on the heaviest sheep in the group. Other methods to try and minimise wormer use and prevent resistance to each of the groups involves only dosing a percentage of the flock or only treating thin ewes. If resistance is suspected a faecal egg count reduction test can be carried out by the vet which involves taking dung samples from individually marked sheep for worm egg counts, dosing appropriately and re sampling after an appropriate period of time to recheck worm egg counts. If worm egg counts do not reduce by over 85% then this strongly suggests resistance. Dung sample should be taken 7 days after dosing with group 2 yellow wormers, 10 days after group 1 white wormers and 14-16 days after group 3 clear wormers.

Prevention

Pasture contamination results from either lambs that grazed there the year before or from ewes in the 2 weeks before, and up to 8 weeks after, lambing when their immune systems are low and their egg output increases dramatically. Control involves pasture management and not grazing lambs on pasture that may be heavily contaminated from last years lambs and where possible rotating pasture between cattle and sheep. Ewes should receive a worm dose at lambing time, depending on the system used either mid gestation at housing when receiving their booster vaccination or, for example, to get the benefit of the long acting action of moxidectin ewes should be dosed at turnout with their lambs instead. Having ewes in good body condition and on a good plane of nutrition,

especially with regards to protein, will help improve their immunity and lower worm egg outputs. Lambs will need dosed throughout the grazing season, the timing of this will depend on weather conditions and the risk forecast.

Liver Fluke

This is a very important and challenging disease in South West Scotland most commonly seen in late autumn/winter. The parasite *Fasciola hepatica* is a trematode whose life cycle includes a water snail and needs wet and warm conditions with a temperature above 10 degrees in order to complete this. The disease takes three forms and sheep are more severely affected than cattle:

- 1) Subacute fluke – results in poor body condition and fleece quality despite adequate nutrition. This occurs after several weeks/months ingestion of fluke larvae. This occurs often from December onwards but with a high challenge can be earlier in the autumn.
- 2) Acute fluke – typically occurs after a very wet summer in August till October and results in sudden death as a result of bleeding from liver damage from migrating immature fluke. Affected lambs may be dull, pale and reluctant to run when being gathered.
- 3) Chronic fluke – sheep will be in poor body condition and may have fluid under their jaw (“bottlejaw”). Affected animals will be anaemic and may die especially if in lamb when their body is under stress.

Diagnosis of fluke is based on clinical signs and time of year. Dung samples can be assessed for fluke eggs. This only detects the presence of adult fluke though, which takes 12 weeks from the sheep ingesting the larvae till the adult fluke produce eggs. A newer test has been developed which detects saliva from fluke larvae at an earlier stage, approximately 8-10 weeks old. Individual dung samples need to be taken for this test.

There are various flukicides available for treatment and strategic dosing should be used. Weather conditions will dictate how often and when treatment may be necessary. A dose in the autumn, typically October followed by a further dose in January and another in May would be a standard protocol. In high risk years an earlier dose in September may be warranted. Unlike with worming after dosing sheep should be moved to clean pasture where possible.

Triclabendazole kills all fluke down to 2 days old and is the drug of choice in the autumn when acute fluke is the major threat. However there is a growing number of farms where the fluke have become resistant to this drug unfortunately. This creates a huge problem on farms where fluke is a serious issue. It is important to remember that it is the fluke that are resistant to the drug, not the sheep therefore infected sheep if moved to different pasture will take the resistant fluke with them and contaminate the other ground. Buying in stock is therefore a risk and all purchased animals should be treated on arrival with an appropriate flukicide. Other flukicides such as Closantel and Nitroxynil will only kill later stages of fluke as well as adults, care must be taken with the dosages of these drugs also. Other drugs such as Oxytocyanide will only kill adult fluke.

Biosecurity

There is an alarming amount of diseases which can be introduced into a flock through purchasing replacements, by inadequate boundaries allowing straying of sheep or by sharing equipment. Purchased animals should ideally come from a known source. There are various health schemes available for diseases such as Maedi Visna (MV), Caseous Lymphadenitis (CLA) and Enzootic abortion. Any equipment shared between farms should be properly disinfected between premises as diseases such as CLA and sheep scab can be spread in this manner. All bought in stock should be quarantined for one month. They should be housed for 48 hours and receive a group four (orange) worm dose and fluke dose as well as a treatment for scab, either dipping or injection. Close inspection should be paid for signs of lice and treated appropriately. Footbathing should be carried out and any vaccines as used with the rest of the flock should be administered. Any blood testing should be carried out e.g. for MV, Johnes.

Diseases around lambing time

Twin lamb disease.

This occurs more commonly in lowland flocks in ewes carrying two or more lambs and is the result of severe energy underfeeding in the flock. Poor quality forage, not enough concentrates or overfat ewes with depressed appetites leads to fat being mobilised in the body and infiltrating organs, especially the liver. The liver cannot function properly and the ewes are unable to make enough glucose to support their high energy demands. Sudden stressful events such as bad weather, housing, handling or vaccination can trigger clinical signs. These include disorientation and separation from the flock, blindness, head pressing into the corner of the pen, fine muscle tremors of the head, anorexia and later on cannot stand. Response to treatment is generally poor. Affected ewes should be penned individually, drenched with propylene glycol, have glucose injected into the vein and steroid injection as well as encouraging them to eat by providing palatable feeds and fresh water. Ewes may be too weak to lamb themselves and must be watched closely in case assistance is needed. Ewes that recover are rarely able to rear a lamb. Ensuring adequate ewe nutrition, especially in the last 6 weeks of pregnancy is essential to prevent this condition.

Hypocalcaemia

Low calcium is not uncommon in older ewes, and commonly occurs when hill ewes are moved down to better pasture prior to lambing. It can also be triggered in the last 3-4 weeks pre lambing by stressful events such as housing, dog worrying or incorrectly formulated rations/mineral supplementation. Clinical signs include depression, weakness, inability to stand and bloat sometimes resulting in green fluid at the nostrils. Later ewes become comatose and die. Treatment evokes a rapid response by slow injection of 20-40mls 40% calcium into the vein. Ewes will stand within 5 minutes and rejoin the rest of the flock. Calcium injected under the skin takes much longer to be absorbed into the body and should always be warmed first.

Watery mouth

This condition occurs in newborn lambs aged 12-36 hours and is a toxic condition caused by E-coli bacteria from the environment which multiplies in the lambs intestines. Lambs with insufficient colostrum intake are most at risk and it is especially common in triplet and twin lambs. Affected lambs are dull, weak, reluctant to suck, salivate profusely, bloat and fail to pass meconium. Death follows rapidly once the infection gets into the bloodstream. In the early stages treatment can be attempted by giving a warm soapy water enema to help them pass meconium, oral antibiotics or injectable antibiotics such as amoxicillin as well as oral fluids four times per day. Prevention is by keeping the lambing environment clean and using disinfectant such as paraformaldehyde powder on straw bedding. Ensuring lambs suck colostrum as soon as possible after birth is essential and in some situations an oral antibiotic given at birth may be beneficial.

Navel Ill/Joint Ill

Navel ill is a consequence of untreated navels of newborn lambs born into dirty conditions. Infection can spread internally, in particular to the liver or joints or to other organs in the body. Dipping of navels with strong iodine twice within the first hour of life is essential.

Joint ill is a result of infection from the environment which is most commonly spread to lambs through their mouths but also can be spread through untreated navels. Lameness usually is present from 5- 10 days old with resulting hot, swollen painful joints. Sometimes the bacteria can settle in the space between the bones in the neck resulting in abscesses, causing lambs to go off their legs. Treatment must be prompt and involves daily injections with appropriate antibiotics. Prevention is by ensuring lambs receive adequate colostrum. Every effort must be made to ensure lambs receive 50ml per kg within the first 4 hours of life, 200ml per kg during the first 24hours of life. Maintaining a clean environment is also essential to prevent this disease.

Hypothermic lambs

These can be split into two groups:

1) Lambs less than 6 hours old

Most common with outdoor lambing during severe weather conditions. The lambs should be warmed first in a lambing box set at 45 degrees. Once the lamb is warmed up colostrum should be given by stomach tube at 50mls per kg.

2) Lambs over 6 hours old

These lambs have used up all of their energy and fat resources and require intraperitoneal injection of dextrose solution prior to warming. 25ml of a 20% dextrose solution should be injected by holding the lamb suspended by its forelegs. A sterile 19 gauge 1 inch needle should be used 1 inch to the side of and 1 inch below the navel pointing towards the tail head. The dextrose solution can be made by mixing 12ml of recently boiled water to 12ml of 40% glucose solution. The lamb should then be warmed in the warm box at 45 degrees.

