Animal & Plant Health Agency

SRUC

GB small ruminant quarterly report

Disease surveillance and emerging threats

Volume 25: Quarter 3 July to September 2022

Highlights

Contents

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Introduction and overview

This quarterly report reviews disease trends and disease threats for the third quarter of 2022, July to September. It contains analyses carried out on disease data gathered from APHA, SRUC Veterinary Services division of Scotland's Rural College (SRUC) and partner postmortem providers and intelligence gathered through the Small Ruminant Species Expert networks. In addition, links to other sources of information, including reports from other parts of the APHA and Defra agencies, are included. A full explanation of how data is analysed is provided in the annexe available on GOV.UK.

APHA's new Endemic Disease Alert System

This is a new component of the communications from our scanning surveillance network and a new system that the APHA will be using to keep you up to date with significant disease alerts and information, projects, publication of reports and other items.

This is independent of the notifiable disease alert system.

To receive these notifications please respond to siu@apha.gov.uk

Providing your preferred:

- email address you would like us to use
- mobile telephone number if you wish to receive text alerts

We hope that you find this new messaging system to be beneficial and any suggestions or feedback are welcome. Please contact the Surveillance Intelligence Unit SIU@apha.gov.uk for more information.

Animal Health and Welfare Pathway

The Animal Health and Welfare Pathway (the Pathway) is to launch in 2022. As Direct Payments decline, government will reinvest some of the money to support the production of healthier, higher welfare animals. This will provide incentives for farmers to go above the regulatory baseline and reward higher animal health and welfare on the farm.

The priorities identified for sheep:

- provide a tailored health screening to address a range of endemic diseases, estimated to cost the sector around £85 million per year, initially this will focus on internal and external parasites (and associated anthelmintic efficacy), mastitis, 'iceberg' diseases and those inducing abortion

- reduce lameness as it is one of the most common signs of ill health and discomfort among sheep, affecting animals' mobility, productivity, and longevity
- improve ewe sustainability, optimising body condition so that ewes are less susceptible to disease, produce better quality milk and can rear a greater number of healthier lambs
- improve pain management during castration and tail docking, we want to support the licensing and uptake of pain relief to reduce the impact of these procedures

The first funding stream includes the Annual Health and Welfare Review . It offers farmers funding for an annual visit, from a vet of their choice, to consider the health and welfare of their animals. This includes carrying out diagnostic testing, reviewing biosecurity and the use of medicines, and providing bespoke advice on actions and available support to improve the health and welfare of their animals. Specifically for sheep this includes testing to find out how effective the anthelmintic being used is in the sheep tested.

Issues and trends

Weather

The summer was warmer than average, most particularly in some eastern counties of England where mean temperatures were nearly 2 °C above average, and maximum temperatures were far above average over most of England. A new UK record of 40.3 °C was recorded at Coningsby (Lincolnshire) on 19th July.

During August the provisional UK mean temperature was 16.7 °C, which is 1.5 °C above the long-term average. Rainfall ranged from near average to only 20% of average.

During September the UK mean temperature was 13.4 °C, which is 0.5 °C above the long-term average. Rainfall was broadly near average overall, rather dry in northwest Scotland and East Anglia, although some parts of southeast England, eastern Scotland and Northern Ireland had well over 150% of the month's average.

These increased temperatures raised concerns for the risk of Haemonchus, and an EDAS alert was issued. Sudden deaths due to Haemonchosis have been confirmed in adult ewes from two flocks by APHA recently in Devon. At this point in the summer, be alert to the possibility of haemonchosis in grazing sheep and goats, particularly after heavy rains, as this tropical subtropical parasite is better able to survive in warmer temperatures in contrast to our more usual gastrointestinal (GI) parasites for example *Teladorsagia circumcincta*. Clinical signs are anaemia, rarely with diarrhoea, and subcutaneous oedema (bottle jaw) where H. contortus predominates in the host. There is little immunity acquired to this parasite, so disease can be seen in lambs and adults. APHA VIC Carmarthen can

carry out differential staining on Trichostrongyle type eggs to detect H. contortus eggs (Test Code TC0777).

During July to October APHA was offering free testing for Haemonchus where sheep presented with anaemia, with no diarrhoea, and subcutaneous oedema (bottle jaw) or where Haemonchus was suspected for other reasons.

[Information note on Haemonchus]

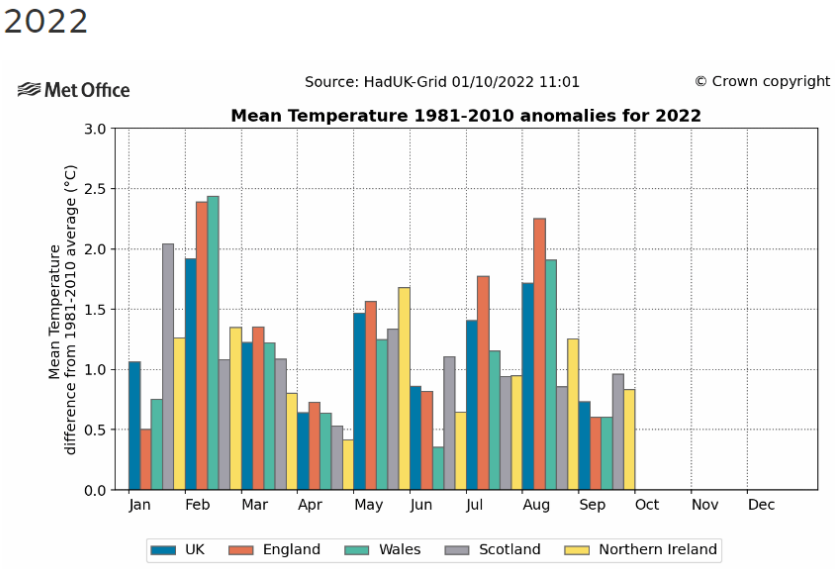

Figure 1: Mean temperature 1981 to 2010 anomalies for 2022

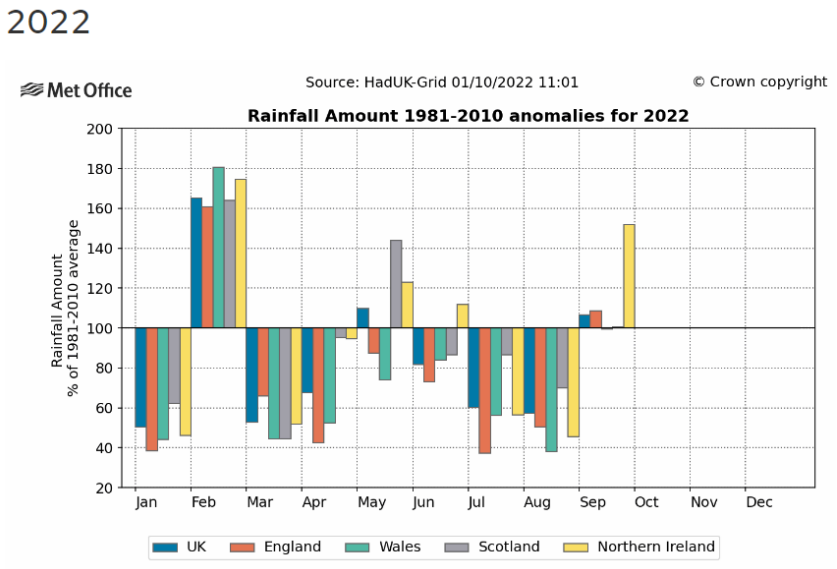

Figure 2: Rainfall amount 1981 to 2010 anomalies for 2022

Industry

Prices: The late summer and autumn seasonal dip in prices took place a month later this year than last year. Prices are now below those seen in 2021 but remain considerably higher than the 5 year average. New season liveweight lamb prices were 233.0p/kg in the week ending 5 November 2022 and new season deadweight lamb prices were 519.5p/kg in the week ending 29 October 2022.

Production: The UK has produced 200,700 tonnes of sheep meat so far in 2022 (January to September), 5% more than at the same point last year. UK lamb kill is up 4% year on year, totalling 8.7 million.

Trade: The UK exported 5,600 tonnes of fresh and or frozen lamb in August 2022, a 3% decline from July and a 10% decline from this time last year . Fresh carcasses and half carcases were the primary product traded with 79% of shipped volumes falling into this category. Imports of fresh and or frozen lamb totalled 3,000 tonnes in August 2022, a 43% drop compared to July 2022 and down 6% year on year. Imports do seasonally begin to drop at this time of year as UK production is at its highest.

Demand: In the 12 weeks ending 2 October 2022 spend on lamb declined 12.5% year on year while volumes purchased fell 19.9%. As inflation causes price rises retail sales of lamb are coming under increased pressure as consumers react to the cost-of-living crisis.

Update provided by Freya Shuttleworth Agriculture and Horticulture Development Board (AHDB)

Unusual diagnoses

Swayback in goats

Swayback was diagnosed in a three-week old goat kid submitted with a history of chronic weakness and ataxia. This was first noted in the perinatal period. Investigation was undertaken to establish the aetiology as the goat was one of triplets, though neither sibling was displaying any clinical signs. The small holding comprised of 12 adults which were currently indoors and fed hay and straw. Postmortem examination (PME) was grossly unremarkable except small areas of consolidated lung tissue involving approximately 15% of the cranial lobes. Histology identified cerebellar cortical degeneration and necrosis consistent with swayback. Advice was provided in respect to reviewing the trace element status of the diet.

This is a useful and timely reminder that swayback due to inadequate copper availability to dams during gestation can occur in goats.

Suspicion of Bluetongue disease

In recent months there have been three suspicions of Bluetongue disease in sheep reported to APHA.

Case 1

A Private Veterinary Surgeon (PVS) reported suspicion of bluetongue in a flock of 70 sheep. The animals were grazing a field away from the main premises and 2 ewes presented with submandibular oedema, swollen and crusty lips and slightly elevated temperatures. No coronary band lesions or lameness was reported. The PVS suspected Orf but given the facial swelling, crusting around the mouth and nose (Fig 3), Bluetongue was on the list of differentials.

Figure 3: Crusting around the mouth of a ewe and lesions on the hard palate.

An APHA report case was initiated and an APHA vet visited the farm and inspected all the sheep on the holding. The two ewes had severe lesions around the lips and under the chin with swelling of the skin and crusting, and papules were found inside the mouth, which were typical of severe orf infection. The coronary bands were unremarkable.

One ewe also had a bloody papule on the teat, again typical of an orf infection and a further ten sheep were showing early clinical signs of orf with one lamb found to have a papule in the interdigital area. Samples were sent to Pirbright for testing for Bluetongue virus and were negative.

Skin swabs and scabs were submitted for testing and Orf virus was confirmed by electron microscopy. A very heavy pure growth of *Staphylococcus aureus* was cultured from the skin beneath the lesions.

Case 2

A farmer found a ram with a swollen head and mouth. The following day 3 more rams presented with swollen heads and crusty muzzles (Figure 4) and the PVS attended and felt BTV could not be ruled out, APHA investigated, samples for BTV taken and subsequently was ruled out. Following negation of BTV the PVS sent in biopsies and a scab which confirmed parapox virus on PVR and on immunohistochemistry.

Figure 4: Swollen head and crusty muzzle in a ram with suspect BTV.

Case 3

This case involved a farm with 236 sheep and 36 cattle. The farmer had reported one lamb under 6 months old with ulcer like lesions in the mouth (Figure 5), salivation, a swollen muzzle, and a temperature of 40.0°C. APHA field vets investigated and inspected sheep on the holding and only this one lamb was affected. It was showing signs including swollen

muzzle and lips, mucopurulent nasal discharge, white raised spots on oedematous and cyanotic tongue, submandibular oedema, injury on rostral upper gums. Samples were collected for BTV which returned a negative result. Only one lamb was affected at the time of inspection, orf was suspected but no samples were taken for further investigation.

Figure 5: Swollen lips, oedematous tongue with raised white lesions.

Surveillance for exotic notifiable disease is vital and any suspicions should be reported to APHA. Scanning surveillance is keen to investigate negated report cases further and samples for testing can be funded by the scanning surveillance program where the notifiable disease has been ruled out (Carson 2020).

Changes in disease patterns and risk factors

Syndromic alerts were raised this quarter for the following diseases: Pneumonia due to Mycoplasma ovipneumoniae, PGE due to Haemonchus, Louping Ill, and Tick Borne Fever.

Parasitology

Parasitology literature review

The APHA parasitology group: annual review of literature and horizon scanning report 2020 has been published

Haemonchus in sheep

As previously described during July to October 2022 APHA offered free testing for haemonchus.

Free testing, for haemonchosis ended on the 28 October 2022. This used the APHA peanut agglutination stain which differentiates Haemonchus eggs from trichostrongyle eggs. Clinical signs of haemonchus include pale mucous membranes and sub mandibular oedema and no diarrhoea. This blood sucking parasite can sometimes catch farmers out as the sheep don't present with diarrhoea and often the signs of submandibular oedema (bottle jaw) can be interpreted by farmers as being due to liver fluke. This is normally considered to be a tropical or subtropical parasite, but recent warm weather caused concern that cases may be increasing. Interestingly, Haemonchus is known to be a prolific egg layer and in most positive cases there was a correlation between high FEC and high percentage of haemonchus, although not always, with some very high FECs with low or no haemonchus detected.

We are looking at the findings and will produce a Focus article in the Vet Record. However, some headlines are:

- 256 separate submissions from individual farms; haemonchus detected on 207(81%)
- 342 samples tested; haemonchus detected in 277(also 81%)
- Average Fecal Egg Count for haemonchus positive submissionswas10,707epg (based on 227 haemonchus positive cases where the trichostrongyle count was available)

All classes of anthelmintics have activity against *H. contortus*. In addition, Closantel will also kill *H. contortus* but not other gastrointestinal worms.

Parasitic gastroenteritis (PGE) and clostridial enterotoxaemia type D in a goat

A dead Golden Guernsey Goat was submitted for PME following four days of watery diarrhoea, bloating, and a reduced appetite. It had been housed for the previous couple of days for monitoring and was prior to that was in a grass paddock with another nine goats. There were 14 goats in total on the holding. The goats were fed a standard goat mix and

had ad lib soaked hay, there was no access to toxic plants likely, but the goats were sometimes given Willow to browse. The goats were last wormed at the beginning of August and occasionally some goats had previously shown bloating and diarrhoea. The carcase received had brown dried faecal soiling of the hair on the caudal rump, hocks and on the tail and brown liquid faeces at the perineum. The rumen was well filled with brown thick liquid contents and long fibre, and there were similar contents in the abomasum, small and large intestines.

Epsilon toxin was detected in intestinal contents and there were high faecal worm egg counts 6000 Trichostrongyle type eggs (per g) and a total worm count as shown in Table 1.

Table 1: Total worm count (TWC) from Abomasum (Abo) and Small Intestines (SI) of Gastrointestinal Tract (GI)

Parasite Total Worm Count	(Abo and SI in GI tract)
Abomasum *Haemonchus spp.*	500
Abomasum *T. axei*	100
Abomasum Immature and or L4	300
SI *Nematodirus battus*	300
SI *Trichostrongylus spp.*	2000
SI Immature and or L4	1900

Diarrhoea in adult goats is generally due to either clostridial enterotoxaemia or to PGE. The presence of epsilon toxin and evidence of enteritis are consistent with a *Clostridium perfringens* enterotoxaemia type D, which in combination with a heavy worm burden, will have induced severe diarrhoea and death. Intestinal *Trichostrongylus* spp. worms predominated, although *Haemonchus* worms were also identified. Worm damage to the intestines may have encouraged clostridial overgrowth and the concurrent enterotoxaemia.

Compound intake can also precipitate rumen acidosis tiggering clostridial overgrowth thus, compound feed should be fed at maintenance levels unless pregnant or lactating and depending on the type of mix, this might be only 0.5 to 1.0 Kg per animal. In addition, high quality meadow hay should be provided and preferably have been assessed for quality, storage, and accessibility

A worm management plan was recommended for the goats, with regular faecal egg counts performed to assess response to treatments and the potential build-up of parasites in the environment.

Clostridial vaccination is vital to prevent further issues. In the UK goats usually suffer from C perfringens Type D and tetanus. Trials have shown that the immune response in goats to vaccination results in a poorer and shorter lived immunity than in sheep. It is recommended to give them minimal antigen to achieve maximum response. Two initial vaccinations are required followed by 6 monthly boosters. Pasteurella components of vaccines introduce further antigens that may not be required and should only be given if necessary (if pasteurellosis becomes an issue), as a separate vaccination time and vaccine.

A useful resource on Goat Health Planning can be found at In Practice (Harwood 2016).

Respiratory disease

Ovine pulmonary adenocarcinoma and *Mycoplasma* infection in a bought in ram.

A bought in 2 year old Charolais type ram was euthanased and was submitted for PME to investigate the cause of weight loss and respiratory signs. There was extensive severe pathology in the lungs of the ram which included two distinct 4cm and 6cm diameter firm pale grey to white masses, one in the tip of the right middle lung lobe and one in the medial ventral section of the right caudal lung lobe. There was a similar 3cm diameter mass in the left middle lung lobe. The ventral sections of all the lung lobes were purple and “rubbery”, with multifocal 0.5 to 1cm firm white nodules scattered throughout (Figure 6).

Figure 6: Ovine Pulmonary Adenocarcinoma tumour nodules associated with areas of Mycoplasma pneumonia.

Ovine Pulmonary Adenocarcinoma tumours were suspected from the gross changes, and the diagnosis was confirmed with histology. The purple areas of lung consolidation looked typical of mycoplasma infection and *Mycoplasma ovipneumoniae* infection was confirmed by DGGE PCR; lymphoplasmacytic bronchiolar cuffing, consistent with this infection, was observed on histology. The unusually diffuse small tumour nodules scattered throughout the purple areas in this animal suggested that the mycoplasma infection had exacerbated or accelerated tumour proliferation. Rapid OPA tumour growth has been described in sheep suffering from other respiratory disease issues.

The Sheep Veterinary Society Autumn Conference in Penrith in October 2022 featured OPA with a number of presentations exploring the efficacy of transthoracic ultrasonography for OPA screening in flocks (Davies and others 2022): including one farmer's experience with OPA scanning, one vet's case of aggressive culling to control OPA, and recent research into OPA diagnosis, this was followed by a discussion panel which included discussion by audience members who were in favor of using scanning for OPA control (Cousens and others 2022) . These will be available in the Sheep Veterinary Society's proceedings soon.

Nervous disease

Louping ill

Following on from Quarter 2, diagnoses of Louping ill were again increased this quarter with 9 cases (3.44%) recorded in 2022 compared to 7 cases (2.13%) in 2021. Diagnoses by APHA were increased, whereas diagnoses by SRUC remained static. Peaks in diagnoses are often seen in Quarter 3, however this is the first time since 2014 when increased case numbers have been recorded consecutively in Quarters 2 and 3. As the ecology of *Ixodes ricinus* is closely linked to temperature and humidity, this change is most likely a reflection of the climatic conditions this year which have been more suitable for tick survival and activity.

Systemic disease

Hypocalcaemia in lamb's secondary to PGE and dietary change

Recumbency and deaths were reported in a group of 40 Jacob lambs. The group had been recently weaned and kept indoors with access to hay a barley mix. Within five days of weaning, five lambs had died and several more had become recumbent with no response to antibiotic and anti-inflammatory treatments. The groups were not vaccinated against clostridial disease and had not been recently wormed. Two typical cases were submitted for PME. Ruminal acidosis was confirmed in one with rumen containing yellow coloured fluid with short fibre and cereal grains. Rumen liquor pH was 3.5. Parasitic

gastroenteritis was diagnosed in the other lamb having a faecal worm egg count of 3750 trichostrongyle type worm eggs per gram. Interestingly both lambs submitted were hypocalcaemic and blood samples taken from the remaining recumbent lambs and tested in house by the submitting practice also had low blood calcium levels. These all responded to calcium treatment and no further deaths were reported. It is well recognised that both PGE and acidosis can affect nutrient absorption. It was postulated that the hypocalcaemia was the reason for recumbency in these lambs, most likely a result of the culminative effect of the high worm burden, stress of weaning, stress of housing and abrupt change in forage. A review of the weaning process for future years was recommended.

Systemic pasteurellosis with no premonitory signs

Systemic pasteurellosis with no premonitory signs was diagnosed at various APHA VICs during quarter three, highlighting the importance of vaccination as the following cases describe:

Bibersteinia trehalosi septicaemia (septicaemic pasteurellosis) was the cause of death of an eight week old lamb submitted to APHA VIC Starcross. The lamb was found dead with no premonitory signs, the twelfth to die from a group of 800 unvaccinated lambs. Gross PME revealed a fibrinous pneumonia, together with haemorrhages in the thymus, in the subcutaneous tissue and on the epicardium, indicative of a likely septicaemia. The organism was cultured in purity from multiple tissue sites.

Systemic Mannheimiosis was diagnosed in 12 week old lambs submitted to APHA VIC Thirsk for postmortem having died with no premonitory clinical signs. The lambs were sourced from various farms and were at pasture and provided hay and fattening pellets. The lambs had been wormed recently and had started a clostridial vaccination programme. A total of five from 120 had died in the previous 24 hours. At PME there was a stable foam occluding the trachea with a fibrinous pleuropneumonia. The lymph nodes associated with the respiratory tract were enlarged and oedematous. Bacteriology recovered *Mannheimia haemolytica* from multiple sites confirming septicaemic distribution. A review of the vaccination programme and assessment for potential stressors was advised.

Pasteurella septicaemia (likely *Bibersteinia* infection) causing sudden death in a 4 to 5 month old mule lamb was suggested by histology, after postmortem samples were submitted to APHA VIC Shrewsbury for testing. Four lambs out of 400 had been found dead.

Streptococcal infections

Streptococcal infections were diagnosed with varying presentations during quarter three.

Case 1

Vegetative endocarditis and terminal *Streptococcus suis* type 2 septicaemia was found as the cause of poor condition and death in an 18 month old tup from a small flock submitted to APHA Penrith VIC.

Over four months, the tup had been failing to thrive and has been losing body condition, despite concentrate feeding. This progressed to recumbency in the final week before death.

At PME a severe, chronic, valvular endocarditis, purulent polyarthritis, pericarditis, suspect meningitis, miliary hepatic abscessation and generalised lymphadenopathy was found with:

- Extensive vegetative lesions covering the mitral, aortic, and tricuspid heart valves (Figure 7).
- Miliary abscessation throughout the liver parenchyma, with caseous to calcified purulent contents.
- Red to brown turbid joint fluid, with fibrin tags, in both elbow, carpi, hock and stifle joints.
- A generalised lymphadenopathy with enlarged, oedematous lymph nodes throughout the carcass.
- An increased volume of turbid yellow to brown CSF and diffuse cloudy to opaque appearance of the brain and some flattening of the gyri.

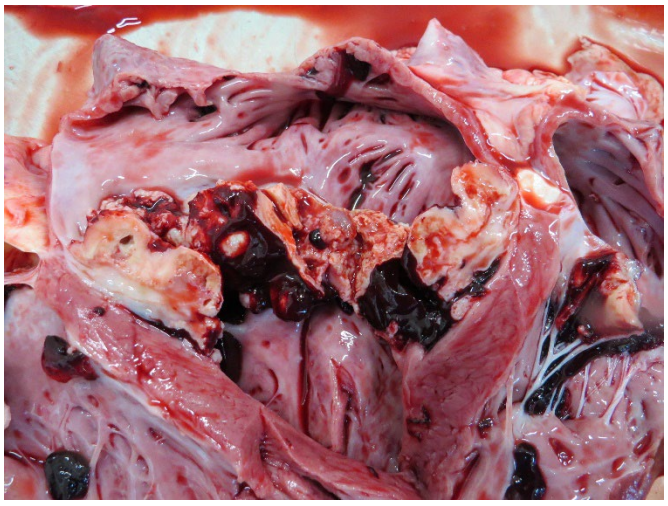

Figure 7: Extensive vegetative lesions covering the mitral, aortic, and tricuspid heart valves

Bacteriology found *Streptococcus suis* Type 2 from the all the sites cultured (brain, left elbow and pericardium). It is thought that the vegetative valvular endocarditis was causing cardiac insufficiency and that this was the reason for the weight and condition loss, and the *Streptococcus suis* bacteraemia and septicaemia was an opportunistic infection in this already debilitated animal.

Case 2

The carcase of a three month old lamb was submitted to APHA VIC Starcross for postmortem examination after being found dead. Approximately 18 lambs from a group of 170 had been found dead over the previous month. The lambs were at grass with their dams, vaccinated against clostridial disease and had recently been wormed with a white drench. Gross postmortem examination was limited by autolysis; however, the findings were suspicious of a toxaemia or septicaemia. *Streptococcus bovis* was isolated in pure growth from the liver and heart blood. This is a recognised commensal of the gastrointestinal tract of animals, so it was thought that this represented translocation across the intestines via the portal circulation resulting in a terminal septicaemia. The lamb also tested positive for Tick Borne Fever, which is a recognised immunosuppressive agent and may have played a role in the deaths reported on farm. A review of tick and pasture management was recommended.

Case 3

Two shearlings were submitted to APHA VIC Bury St. Edmunds from a lowland outdoor farm to investigate the cause of losing condition, coughing, and nervous signs observed in three animals from a group of 180. Multiple abscesses in the lungs and unusually on the floor of the cranial cavity (presumably within the meninges) were detected. The presence of the meningeal abscesses would have account for the nervous signs reported and for the death of these shearlings. *Streptococcus ovis* was isolated from the brain abscess of both animals. This organism has been previously recovered from abscess in sheep. CLA was not diagnosed. *Mannheimia haemolytica* and *Mycoplasma ovipneumoniae* were also detected from the lung of one lamb. Both these sheep had lost condition and a diagnosis of parasitic gastroenteritis was confirmed in one sheep by the detection of more than 300 Trichostrongyle type eggs per gram.

Centre of Expertise for Extensively Managed Livestock (COEEML)

The COEEML conference was held on 24 November 2022 in Aberystwyth. For more details on the conference please see the COEEML pages on the Vet Gateway.

Salmonella

The Salmonella in Livestock Production in GB 2021 has been published on Gov.uk. This annual publication provides data on reports of salmonella in livestock species in Great Britain (England, Wales, and Scotland) which was collected and collated by the Department for Environment, Food and Rural Affairs (Defra).

Isolations of Salmonella from sheep in 2021 were 87.0% higher than during 2020 (144 versus 77 isolations) and 39.8% higher than during 2019 (103 isolations)

Salmonella enterica subspecies diarizonae serovar 61:k:1,5,(7) (and variants) remained the most common serovar isolated from sheep

Salmonella Montevideo was the second most commonly isolated serovar from sheep during 2021 (28 isolations, 19.4% of total isolations), a marked increase on 2020 (three isolations) but within the range typically seen for this serovar since 2008 (between four and 36 isolations per year).

Salmonella Typhimurium remained the third most commonly isolated serovar from sheep in 2021 (17 isolations, 11.8% of total isolations), with over double the number of isolations recorded compared to 2020 (8 isolations, 10.4% of total sheep isolations). The phage types reported during 2021 were U308 (10 isolations), DT104 (3 isolations), DT116 (2 isolations), U300 (1 isolation) and NOPT (1 isolation).

Other serovars reported in sheep as single isolations during 2021 included: S. Indiana (last reported in 2015) and S. Stourbridge (last reported in 2012) both from abortion cases. Salmonella Derby, S. Ajiobo and S. Anatum were also isolated and were last reported in 2011, 2012 and 2013 respectively. Salmonella Mbandaka was isolated 73 times from cattle and once from sheep during 2021 while S. Derby was isolated once from sheep but not from cattle. A clinical history associated with these isolations was not available.

Salmonellae are seldom isolated from goats. In most years single or zero isolations were reported. In contrast, there were two isolations in goats during 2021 including one isolation of S. Dublin and one isolation of Salmonella enterica subspecies diarizonae 61:k:1,5, both of which have been isolated from goats in previous years. This is the highest number of isolations from goats since 2006 (3 isolations).

Anti-Microbial Resistance (AMR) related

Veterinary Antibiotic Resistance Sales and Surveillance (UK-VARRS) report 2021 has been published by the Veterinary Medicines Directorate (VMD)

This year's UK VARSS report continues to document downward trends in sales of veterinary antibiotics in the UK. Veterinary antibiotic sales overall, and sales of antibiotic

classes which are of critical importance to human health, both reduced by a small amount to reach new lowest recorded levels for the UK at 28.3 mg/kg and 0.12 mg/kg, respectively.

The ruminant sector has not had a central system to record antibiotic use to farm and enterprise level until recently. The Medicine Hub, an industry voluntary initiative, developed and managed by AHDB, was launched in 2021 and provides a central location for the collection of medicine data, including antibiotic use. There are currently 500 sheep farmer datasets on the Medicine Hub and a further 845 Welsh farmers who have contributed data to the Welsh Lamb and Beef Producer calculator.

In 2021, full susceptibility to the panel of antibiotics tested was seen in 85.0% of sheep isolates and 75.7% of isolates classified as 'other', which is a slight decrease compared to last year.

Horizon scanning

Bluetongue (BTV) update

APHA no longer has access to the EU's Animal Disease Notification System (ADNS), hence we are now only using World Organisation for Animal Health (WOAH) data and the weekly outbreak summary data published by the new EU Animal Diseases Information System (ADIS) to estimate the disease status in countries near to Great Britain.

Amongst countries in northern and western Europe, the following areas are currently classified by the European Commission as containing circulating BTV8 (Figure 6):

- Mainland France (since 1 January 2018).
- Belgium (since 1 April 2019).
- Luxembourg (since 17 September 2020).
- Switzerland (since 20 April 2021).
- Germany (only the states of Saarland and Rhineland Palatinate; since 14 July 2022).

Amongst these, mainland France is also considered to contain circulating BTV4.

On 28 October 2022 Sardinia reported an outbreak of BTV3. BTV was first reported in Sardinia in 2000 and has become endemic. A national surveillance plan for BTV was put in place in Italy in 2002, allowing periodic testing of sentinel animals. The first cases of BTV3on Italian territories were identified in late 2017, in Sicily. Its circulation in Sardinia was initially evidenced in sentinel animals located in the province of Sud Sardegna, in September 2018. The strain was demonstrated to be almost identical to the BTV3 strain identified in Tunisia in 2016 and 2017. A similar scenario had been observed during earlier

incursions of other BTV serotypes originating from Northern Africa into southern Europe and may be suspected for the current event. Currently, Sardinia is declared endemically infected by BTV serotypes 1, 3, and 4, as illustrated in the EC Bluetongue map (Figure 8), presenting the BTV status of the Member States and their 'infected' and 'free' zones as of 28 Jul 2022.

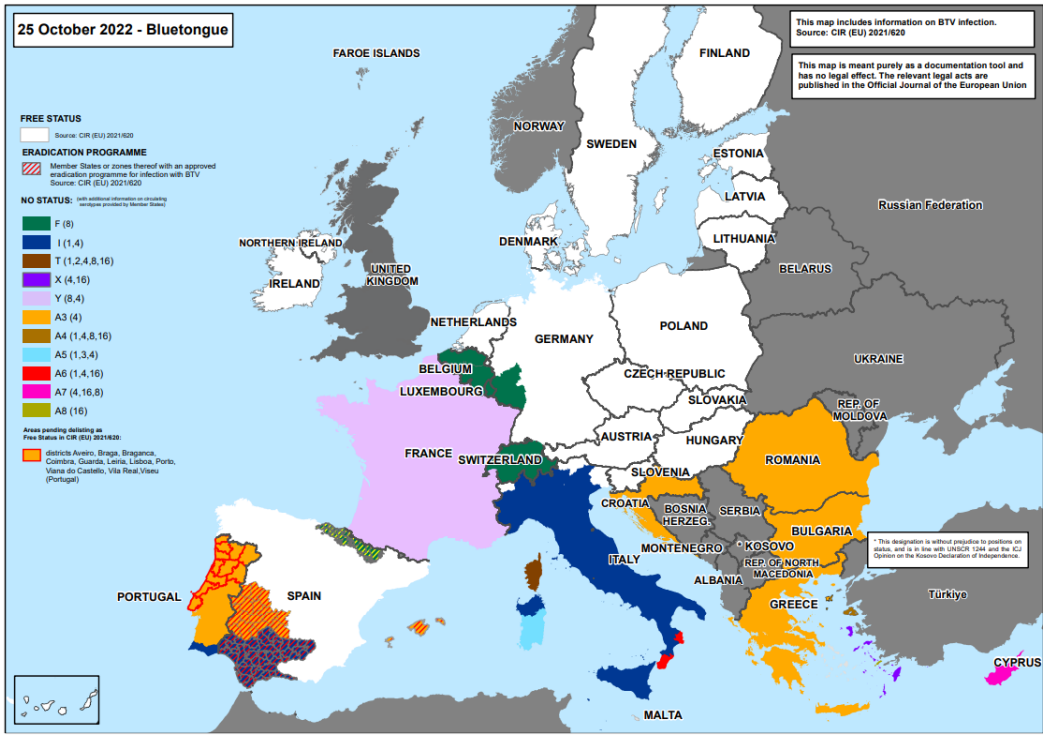

Figure 8: Map showing BTV status of the Member States and their 'infected' and 'free' zones

Sheep and Goat Pox

Sheep and Goat pox was detected on 13 September 2022 in Granada, Andalucía, Southern Spain which is first time since 1968. The farm comprised 314 sheep & 11 goats of which 30 died of 50 sheep affected. No goats were affected. The disease was confirmed as sheep pox virus by RT-PCR. Culling, carcase disposal, cleaning and disinfection and protection zones were implemented with an initial 3 km Protection Zone (PZ) (20 holdings) & 10 km Surveillance Zone (SZ) (61 holdings) and enhanced biosecurity and surveillance measures. Eight more farms were then confirmed in same area (21 September to 12 October 2022), with a total of 2,259 sheep on 9 holdings, exhibiting 5.2% morbidity and 1.3% mortality. Among the 86 goats identified none were affected.

Data based on last follow up report to WOAH (25 October 2022) reported 200 farms in the PZ and SZ areas and at the locations shown in Figure 9, following a further outbreak in 8 farms affected in Castilla La Mancha(22 September to 06 October 2022). Out of a total of

27,259 sheep in this area there was 0.9% morbidity, and 0% mortality. Affected sites included 3 dairy flocks, 3 fattening flocks and 2 assembly centres. No goats were affected.

In summary 17 confirmed outbreaks so far in 2 zones which were epidemiologically linked, most of them by animal movements. (Data based on last follow up report to WOAH 25 October 2022)

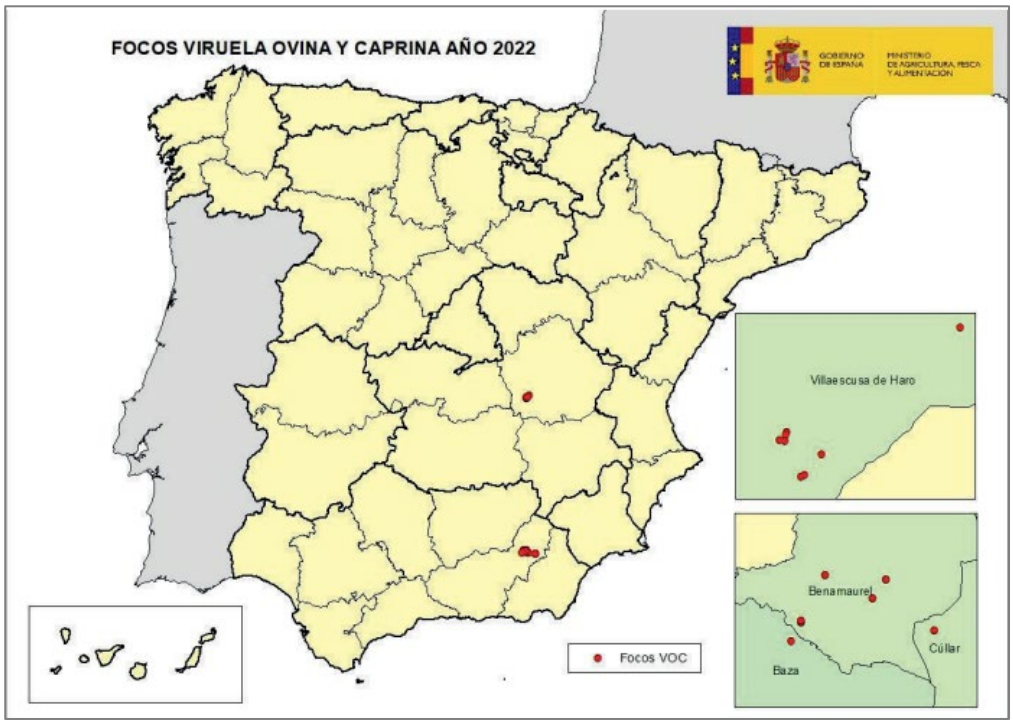

Figure 9: Location of sheep and goat pox outbreaks in Spain, 21 September 2022

GB Risk Assessment

Prior to outbreaks in Spain, the risk of introduction was considered to be negligible as there had been no live animals sourced from affected countries.

After the first outbreak in Spain

Preliminary Outbreak Assessment: the risk of introduction by all pathways increased to low (APHA 2022). This was based on the fact that Great Britain (GB) had not received any imports of live sheep and goats from Spain in the 2 months to 20 September 2022.
GB received imports from Germany, Austria, Netherlands and Republic of Ireland, but none of these consignments originated in Spain.
In July 2022, 1,200 sheep skin hides and 73 tonnes of wool were imported from Spain. Assuming similar imports in August and September, the risk of importation of at least one infected hide or wool bale was estimated to be **very low**.

Globally sheep and goat pox is reported by WOAH (wahis.woah.org) 2012 to 2022 to be in the countries described in Figure 10.

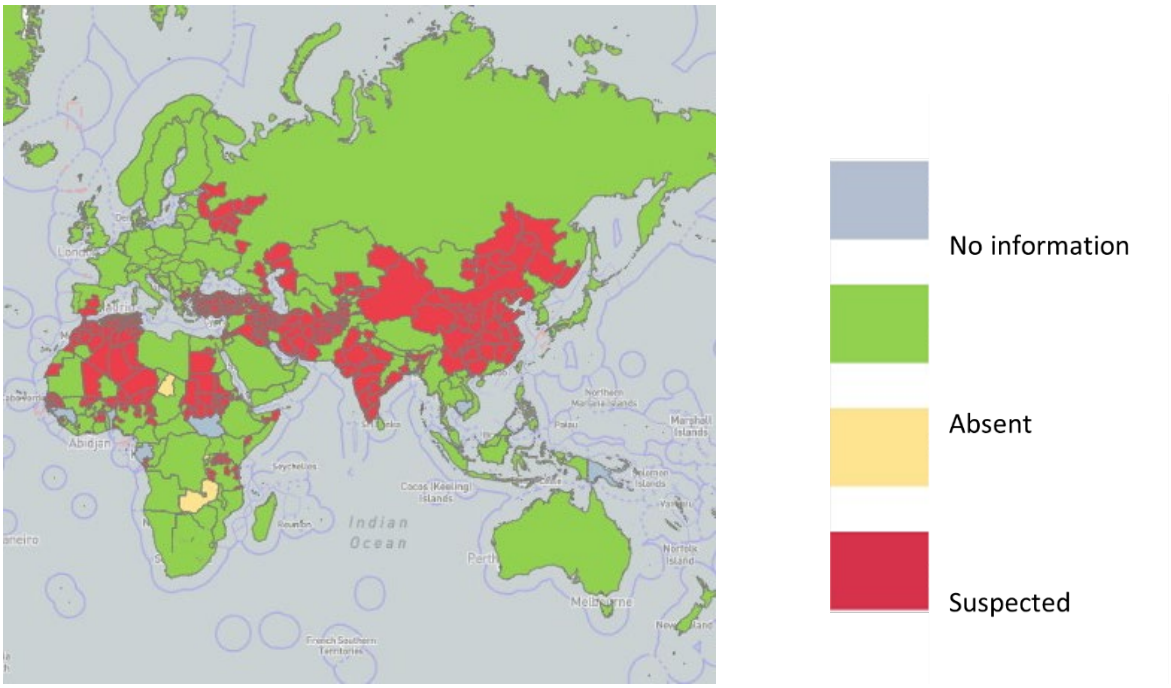

Figure 10: Global distribution of sheep and goat pox.

Clinical signs of sheep and goat pox

- Fever, lethargy, depression, decreased appetite.
- Macules (areas of hyperaemia) leading to papules (0.5 to 1cm nodules in skin) and pustules with necrosis and scab formation after 5 to 10 days (Figure 11). These can persist up to 6 weeks with the development of scars.
- Mucous membranes show development of ulceration or papules.
- Rhinitis, conjunctivitis and ocular and nasal discharge may be seen (Figure 12, 13).
- Enlargement of lymph nodes.
- Generalised form in less hairy or woolly areas (groin, axilla, perineum, udder), around face and muzzle (Figure 14).
- Internal lesions may also be found especially in the lungs leading to dyspnoea but may also be found in the intestinal tract and other organs.
- Secondary bacterial infections often occur.
- High morbidity with mortality of around 5 to 10% in endemic areas, but up to 100% in naïve populations.
- Incubation period of 8 to13 days.

Figure 11: Adult goat affected by sheep and goat pox – generalised skin nodules, Ethiopia

Figure 12: Goat kid affected by sheep and goat pox – generalised skin nodules, ocular and nasal discharge, Tanzania.

Figure 13: Lamb showing generalised sheep and goat pox with ocular and nasal discharge.

Figure 14: Generalised sheep and goat pox showing nodules on the non-hairy area under the tail.

Transmission

The virus is usually present in saliva, secretions from the nose and eyes, in milk, urine and faeces, skin lesions and scabs. The virus can be viable for several months in the environment, in wool and hair, dry skin scabs, and uncleaned animal enclosures. Direct contact with infected animals is the most frequent mode of transmission although inhalation of aerosols of saliva or nasal, respiratory or conjunctival secretions occurs. Indirect contact is a less frequent mode of transmission for example via contaminated vehicles, equipment, bedding, fodder, clothing, footwear, or mechanical transmission via biting flies.

Further references:

WOAH Terrestrial Animal Health Manual

WOAH Disease Card

Defra: Sheep and goat pox: how to spot and report the diseases

Pirbright information on Sheep and Goat Pox

APHA Preliminary Outbreak Assessment Sheep and goat pox in Southern Spain

SGPV situation in Spain and control measures 21/10/2022

Report and images provided by Bryony Jones APHA

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