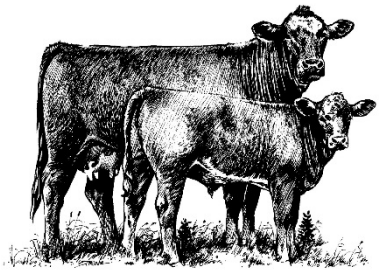
Animal & Plant Health Agency



SRUC

GB cattle quarterly report

Disease surveillance and emerging threats

Volume 32: Quarter 2 (April to June) 2022

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Introduction and overview

This quarterly report reviews disease trends and disease threats for the second quarter of 2022 (Quarter 2), April to June. 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 Cattle Expert Group 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: https://www.gov.uk/government/publications/information-on-data-analysis

Issues and trends

Cattle disease surveillance dashboard outputs

The most frequent diagnoses made in the second quarter of 2022, compared to the same quarter in 2021, and the same quarter for 2015 to 2022 inclusive, through the Great Britain (England, Wales, and Scotland) scanning surveillance network, are illustrated in Table 1. These can be interrogated further using the interactive cattle disease surveillance dashboard which was launched in October 2017.

Table 1: Great Britain scanning surveillance 10 most frequent diagnoses in quarter 2 of 2022, quarter 2 of 2021, and quarter 2 for 2015-2022

10 most frequent diagnoses Q2 2022	10 most frequent diagnoses Q2 2021	10 most frequent diagnoses Q2 2015-2022
1. Pneumonia – M. bovis	1.Navel ill – joint ill	1.Navel ill – joint ill
2. Coccidiosis	2. Cryptosporidiosis	2. Hypogammaglobulinaemia
3. Cryptosporidiosis	3.Colisepticaemia	3.Cryptosporidiosis
4. Hypogammaglobulinaemia	4. Hypogammaglobulinaemia	4. Pneumonia-other cause
5. Rotavirus	5. Pneumonia – M. haemolytica	5. Colisepticaemia
6. Navel ill + joint ill	6.Rotavirus	6. Not listed - digestive
7. Not listed – systemic*	7. Pneumonia – Pasteurella multocida	7.Pneumonia – M. haemolytica
8.Pneumonia-other cause	8. Pneumonia – M. bovis	8. Pneumonia – Pasteurella multocida
9. Not listed – digestive**	9.Not listed - digestive	9. Pneumonia – M. bovis
10. Pneumonia – Pasteurella multocida	10. Pneumonia-other cause	10. Coccidiosis

*Diagnoses not listed (DNL) for systemic disease included amyloidosis, uterine and diaphragmatic rupture, thrombosis, systemic *Bacillus licheniformis* infection, and systemic fungal infection.

** Diagnoses not listed (DNL) for digestive disease included rumenitis, ulcerative typhlitis, liver abscessation, yersiniosis, jejunal stenosis, and abomasal impaction.

Dairy update

Dairy sector updated overview and forecast: https://ahdb.org.uk/dairy-market-outlook

- **Prices**: The UK average milk price for June 2022 was 42.66ppl, according to Defra. This is 2.34ppl (5.8%) up on the previous month: https://ahdb.org.uk/dairy/uk-farmgate-milkprices
  Further increases in milk prices have been announced into September: https://ahdb.org.uk/dairy/milk-price-changes
- **Production**: GB milk production for June totalled 1,047 million litres, a 2% drop in production in comparison to June 2021. High costs continue to hamper any recovery in yields: https://ahdb.org.uk/dairy/uk-daily-milk-deliveries
- **Trade:** Year to date (Jan- May, June data available later in August) volumes of dairy products exported from the UK totalled 487,900 tonnes, up 8% year on year: https://ahdb.org.uk/dairy/trade-dashboard
  The value of these imports has increased 24% year on year to £1.12 billion driven by increased market prices: https://ahdb.org.uk/dairy/world-wholesale-prices
- **Demand:** Over the last year we have seen a decline of -7% for milk, -7% for yogurt, -6% for cheese, and -8% for butter. However, there could be some upside for dairy in retail going forward, as people swap eating out occasions for in home to save money: https://ahdb.org.uk/dairy/consumer-insight-retail-markets

Beef update

Beef sector updated overview and forecast: https://ahdb.org.uk/beef-market-outlook-july-2022

- **Prices:** Although the strong growth trend seen in prices earlier in the year has now flattened, prices still remain at record highs, with prime cattle prices peaking at 443.9p/kg in the week ending 2 July and cull cows at 367.3p/kg: https://ahdb.org.uk/beef/gb-deadweight-cattle-prices-by-region
- **Production:** UK beef production fell to 69,200 tonnes in June, down 2% year on year and 12% lower than in May. Lower production was attributed to lower cattle kill, which stood at 154,800 head, down 4% year on year and 14% less than in May: https://ahdb.org.uk/news/tighter-numbers-constrain-beef-production-in-june
- **Trade:** The UK imported 19,700 tonnes of fresh and frozen beef in May, 3% less than the quantity imported in April, but 13% more compared to May 2021. UK beef exports continued to show strong performance in May, with 11,000 tonnes shipped. While down 3% from April, volumes were up 29% compared to May 2021 (June

data will be available later in August): https://ahdb.org.uk/news/strong-beef-export-growth-continues-in-may

- **Demand:** Overall beef consumption is forecast to drop by a moderate 4% in 2022, dominated by a slowdown in retail sales as consumers move to cheaper protein sources due to the cost-of-living crisis: https://ahdb.org.uk/beef/consumer-insight-gb-household-beef-purchases

Acknowledgment for the dairy and beef updates: Freya Shuttleworth AHDB

Animal Health and Welfare Pathways

The first funding stream for the Animal Health and Welfare Pathways includes the SFI annual health and welfare review - GOV.UK (www.gov.uk). It offers farmers funding for an annual visit from a vet of their choice to consider and review the health and welfare of their animals, and plan for the ongoing farm review process. This includes carrying out diagnostic testing, reviewing biosecurity, reviewing the use of medicines, and providing bespoke advice on actions and available support to improve the health and welfare of their animals. Specifically for cattle this will include discussion on bovine viral diarrhoea (BVD) control, the herd BVD status, and potential testing options for this disease.

Weather

As early as April 2022 farmers were concerned about potential drought conditions occurring in the summer. The cost of fertiliser was exacerbated by the Ukrainian Crisis, and lack of rainfall in April meant that fertiliser applications were often not fully washed into the ground, and both grass and arable crops were anticipated to be less productive.

As temperatures increased over the summer, APHA released an EDAS HOT WEATHER ALERT which described the associated livestock health, welfare, and production problems that may arise during periods of hot weather. Further information on the main risks to Animal Health and Welfare can be found in our Hot weather and potential risk to health and welfare (defra.gov.uk) information note.

Further information on Keeping farm animals and horses in extreme weather can also be found on Gov.uk

New and re-emerging diseases and threats

Tick-borne disease

APHA ran a Bovine Babesiosis Project during 2021 and the findings are currently being collated and analysed. The Cattle Expert Group are still interested to hear about cases of tick-borne disease in cattle throughout the 2022 grazing season.

During 2022, free testing using the dual pan-piroplasm and *Anaplasma phagocytophilum* PCR is available for suspected cases of bovine babesiosis and tick-borne fever, on a case-by-case basis. Submission of samples for testing will not only help inform on-farm control planning but, it will also further aid our understanding of disease epidemiology, which is evolving in the face of climate and land use change. Practitioners should contact their local APHA VIC to discuss potential cases, before sending samples to APHA VIC Starcross if free testing is agreed. The project has highlighted some interesting cases, a few of which are discussed below:

- A farm visit was undertaken to investigate tick-borne disease (both *Babesia divergens* and *Anaplasma phagocytophilum*) associated with urinary signs, anaemia, and death in adult suckler cattle; and the presence of ticks on the farm concerned. This farmer has grazed the land for 31 years, since purchase of the farm, and at the time of the visit had approximately 50 cattle and 20 horses on site. No cattle had been bought-in, apart from a bull which was rented once a year. Tick borne disease had never been noted clinically previously. In total since turnout in May, three cows in the group of 30 had presented with clinical signs, with one dying despite imidocarb diproprionate and blood transfusion treatment. This animal was coinfected with both *A. phagocytophilum* and *B. divergens*, whereas the two surviving cattle were infected with *B. divergens* only. Infections were confirmed using blood smears performed by the private veterinary surgeon, and *Anaplasma* and pan-piroplasm PCR testing performed at APHA. During the visit, the farm and outbreak history were discussed, and grazing fields were examined and dragged for ticks. Ticks were found in every examined field and were collected for PCR testing. Piroplasms were not detected however, A. phagocytophilum was present in 3 nymphs (3/19 15.7%). It was hypothesised that infected ticks had been newly introduced to this farm likely through a wildlife host, and that the herd were likely naïve to tick borne disease. The grazing environment of the animals was bordered by hedgerows, woodland and gorse; and was deemed to be suitable for sustaining tick populations. Advice was provided, with the emphasis being placed on ensuring animals were grazed during the tick active season, before they reached nine months of age, to ensure immunity going forward.
- Coinfection was also suspected in a finishing steer which presented with malaise. Babesiosis was diagnosed via smear examination performed by the private vet, and imidocarb diproprionate and tetracyclines were administered. Despite initial improvement the animal died seven days later, and samples were submitted to APHA, where the *A. phagocytophilum* PCR was positive. The *B. divergens* PCR was negative, which is difficult to explain, but may have been related to recent treatment.
- *B. divergens* PCR was positive in a beef suckler cow on the Mendips, in an area where tick borne disease had not previously been reported. Two out of the group of 30 presented with haemoglobinuria and weakness.
- Two out of three dairy cows tested from a herd of 240 were PCR positive for *A. phagocytophilum*. These animals had aborted in the previous week and the farm had had a history of tick-borne disease in the past.
- The *A. phagocytophilum* PCR was positive in an adult dairy cow which presented with fever and milk drop. Ticks had been noted on the cows.

- One five-month-old Galloway calf was presented dead to SRUC Dumfries with a history of acute respiratory signs, and exposure to ground with a high tick burden for the last four months. There were a significant number of engorged ticks on the carcase, particularly in the inguinal region, and 70% of the lung tissue was consolidated. The spleen was thickened and enlarged. *A. phagocytophilum* DNA was detected by real time PCR from the spleen. Respiratory PCR testing on the lungs detected both Mannheimia haemolytica and Pasteurella multocida in significant quantities. Histological findings were consistent with a subacute bacterial bronchopneumonia, most likely due to one of the Pasteurellacae family of bacteria. Underlying immunosuppression caused by tick borne fever was suspected.

Salmonella Mbandaka isolation from a dairy cow with pneumonia, caudal vena cava thrombosis, and udder cleft dermatitis

Ongoing investigations into a grumbling pneumonia problem in a large, housed dairy herd lead to the submission of an adult cow for postmortem examination. This was the third cow to be submitted over a three-week period. Udder cleft dermatitis had been diagnosed in the first two cows with evidence of secondary spread of infection to the lungs in one. The submitted cow had presented with pneumonia one month previously and some improvement had been noted following treatment, but she then relapsed and was euthanased.

There were several significant findings on gross examination including: an area of healed udder cleft dermatitis on the skin cranial to the front teats; a circular pitted area of fibrosis was present on the diaphragmatic surface of the liver; multi-focal areas of dark red-black discolouration and pockets of thick walled abscessation in the lungs; and marked distension of the caudal vena cava which contained a large linear yellow-red thrombus.

These findings were consistent with a diagnosis of caudal vena cava thrombosis with haematogenous spread of bacterial emboli to the lungs resulting in a secondary pneumonia. There was evidence of a healing liver abscess indicating nutritional issues were a likely predisposing factor. Like the other two cases, there was also evidence of an udder cleft dermatitis lesion in this cow and close examination of the udders in the remaining cohort animals was recommended.

Salmonella Mbandaka was also isolated from the caecal content of this cow. The significance of this is uncertain. This is now the second most commonly isolated serovar from cattle after *Salmonella* Dublin and, can become resident in some herds. It can be found in the faeces of clinically healthy animals but, can also cause disease (typically diarrhoea); often this is in herds where other infectious, nutritional, or management issues are also present. APHA are interested in investigating herds where grumbling issues, potentially linked to S. Mbandaka, are suspected. A useful review of S. Mbandaka in Scottish herds by SRUC can be found here: https://www.sruc.ac.uk/media/plqfemyz/the-scottish-governments-veterinary-services-programme-2020-21.pdf

Investigation of a negated Foot and Mouth disease report case

Blood samples were submitted from a 16-month-old fattening heifer that had developed acute onset shifting lameness and separation of the coronary band of all four feet. The animal was also drooling and had widespread oral erosions present on the dental pad. No buccal or tongue erosions were noted. Both eyes had corneal oedema. The animal remained pyrexic, despite anti-inflammatory treatment. The case was initially reported by the private veterinary surgeon to APHA field services as a suspect case of Foot and Mouth disease. This was negated and blood samples were received for differential diagnosis testing. A diagnosis of Malignant Catarrhal Fever was confirmed with detection of Ovine Herpesvirus-2 on PCR testing.

Changes in disease patterns and unusual diagnoses

Systemic disease

There were no significant trends for systemic disease this quarter.

E. coli septicaemia in a 6-month-old calf

A 6-month-old calf was examined postmortem at APHA VIC Carmarthen. It was from a rearing farm and, was reported as having had signs of respiratory disease for two days before it died. It was the third calf with respiratory signs to die in a group of 49, with around 300 other calves on the unit. It had received an intranasal RSV and PI3 vaccine, and a second pneumonia vaccine (PI3, RSV, IBR and BVD), plus a ringworm vaccine, at the previous holding.

Severe fibrinous pleuritis, pericarditis and peritonitis were identified postmortem. Haemorrhages were present on the abomasal mucosa. Pure cultures of an *E. coli,* which was resistant to tetracycline and ampicillin, were isolated from liver, pericardium and lung.

This is a very unusual diagnosis in a calf of this age, although *E. coli* septicaemia cases were investigated last year by SRUC. Colisepticaemia is usually a disease which is diagnosed in neonatal and young unweaned calves, often associated with insufficient systemic colostrum absorption. Investigation by histopathology did not detect any significant predisposing factors; a severe mucosal neutrophilia and thrombosis were evident in the abomasum, possibly occurring secondary to the septicaemia (although this could also have been the original site of bacteraemia). Follow up discussions with the practitioner indicated that there were no further calves affected.

Figure 1: Fibrinous pleuritis in a 6-month-old calf with E. coli septicaemia

Digestive system disease

There was an increase in cattle persistently infected with Bovine Viral Diarrhoea (BVD) as a percentage of diagnosable submissions, compared to quarter 2 of 2021 (from 2.2% to 3.8%).

Bovine Viral Diarrhoea in a calf

The third calf from a group of heifers to be born weak and displaying neurological signs (opisthotonos, ataxia, head twitching) was submitted for investigation. The calf presented with signs of diarrhoea prior to death. None of the calvings had been assisted and the calves had different sires. The dams had been grazed on moorland until housing. The farmer had bought in animals from herds of unknown health status and had recently had an animal test positive for BVD antibodies. BVD vaccination had only recently been commenced.

The calf appeared small for its age and was dehydrated. The mucosa of the abomasum had a mucoid appearance, with superficial petechiation of some of the mucosal folds, and the intestinal content was dark-pink. A heavy pure growth of multidrug resistant *E. coli* was detected in the lungs of the calf, which was considered to be the result of terminal or opportunistic colonisation. PCR testing for BVD was positive and histological examination of the brain found unilateral, focal, subacute, necrotising leukoencephalopathy (white matter necrosis), without associated inflammation, which likely accounted for the neurological signs described. IHC confirmed the presence of pestivirus antigen within neurons of the CNS and it was concluded that this was a BVD persistently infected calf.

Parasitic gastroenteritis (PGE)

PGE can occur in any grazing animal and, should be considered for those which are failing to thrive, especially if also diarrhoeic. It is important to bear in mind that faecal worm egg counts are not reliable for identifying significant parasite burdens in cattle, and even counts as low as 50 eggs per gram, especially if in liquid faeces, are potentially significant.

APHA and Moredun Research Institute are currently running a surveillance project which aims to investigate *Ostertagia ostertagi* in cattle in England and Wales; and resistance, or reduced efficacy, of *O. ostertagi* to benzimidazoles. Free worm egg counts are available on faeces samples from first season grazing animals, details are available under the 'Current Projects' section at: APHA Vet Gateway - APHA's Centre of Expertise in Extensively Managed Livestock (defra.gov.uk)

A grazing and parasite-monitoring plan should be implemented for young stock in their first season at grass. Where possible, animals should be regularly monitored for weight gain, and for worm burdens by faecal examinations for parasite eggs. Screening faeces samples for fluke eggs later in the year should also be considered. If significant parasitic burdens are identified, effective treatments can be used, and the health plan updated. A Surveillance Focus article Monitoring parasite burdens and investigating suspected parasiticide resistance in cattle was recently published.

Further advice on endoparasitism, grazing management, and the effective use of anthelmintics, is available at Control Of Worms Sustainably (COWS).

Type 2 ostertagiasis in a seven-year-old cow

A seven-year-old Ayrshire cow was seen staggering around a field, in which another in the group had recently died. She died and was submitted to SRUC Dumfries. On PME the liver was a pale-yellow colour, and there were diffuse areas of the abomasal mucosa that were covered in nodules. The abomasal pH was 6.12 and there was a marked scour. The front left quarter had evidence of mastitis, with bloody milk and gas production. Vitreous humour magnesium and calcium levels were unremarkable. No strongyle eggs were detected on faecal egg count, but *Ostertagia* spp. worms were seen in the abomasal content. No significant isolates were detected from the udder. On histopathological examination parasitism consistent with ostertagiasis was confirmed in the abomasum. Hepatic lipidosis with inflammation and necrosis was also detected, which explained the jaundice and was considered a possible cause of death. The final diagnosis was Type 2 Ostertagiasis with secondary hepatic lipidosis and associated necrosis. SRUC distributed an email alert, reminding practitioners to consider Type 2 Ostertagiasis in outbreaks of unexplained diarrhoea. A data review to evaluate the frequency of high pepsinogen and low worm-egg counts in spring months, compared to other months, is being undertaken.

Coccidiosis

As for quarter 1 2022 and quarter 1 2021, coccidiosis diagnoses (as a percentage of diagnosable submissions) had increased for quarter 2 of 2022, compared to quarter 2 of 2021.

Faeces and fixed intestinal tissue were received, following an on-farm postmortem examination, to investigate scour and acute death in a group of five, three-week-old dairy calves. The scour contained fibrinonecrotic casts. No Salmonella, *Cryptosporidia* spp, or coccidial oocysts were detected on laboratory testing of the scour sample. Histopathology

was subsequently undertaken, which revealed a severe acute to subacute erosive colitis, with large numbers of intracellular coccidia, consistent with a diagnosis of coccidiosis. As this case demonstrates absolute oocyst counts can sometimes be unreliable and may be negative in acute cases.

Eimeria alabamensis should be considered in grazing animals with clinical signs of enteric disease. Cattle are usually affected in their first grazing season, typically at over 12-weeks-old, but outbreaks have been observed in cattle up to two years old. For cases where the significance of a coccidial oocyst count is uncertain, speciation of the coccidia can provide useful information.

Abomasal impactions in dairy heifers

During quarter 2 2022, APHA were made aware of cases of apparent abomasal impaction in 9-15m old Holstein Friesian bulling and in-calf dairy heifers on two farms. It was reported that the majority, or all, of the affected heifers had the same sire.

The heifers presented with progressive abdominal distension and condition loss, became inappetant, and had to be euthanased. No obvious dietary or management risk factors have been identified so far.

At postmortem examination the ruminal contents had a distinctive frothy texture. The abomasal contents were very firm and impacted. The gross findings were similar to that found in Suffolk sheep with Abomasal Emptying Defect. There were no striking histopathological findings. The Cattle Expert Group would be interested to hear about other similar cases.

Respiratory system

Ruminal Bloat, Acidosis and Pneumonia in a Calf

One 4-month-old calf was submitted to investigate sudden death. Another two had recently died suddenly from the same group of 55. All three appeared bloated when found dead. The calves had been fed silage, maize and 1.5kg blend for the previous two weeks. Following the death of the first two calves, the maize was reduced, and hay was added to the diet. Vaccination against Parainfluenza-3 virus (PI3), Bovine Respiratory Syncytical virus (BRSV) and *Mannheimia haemolytica* had been given.

The calf had ruminal bloat, ruminal acidosis, and severe pneumonia. The antero-ventral lung was consolidated and there was a large bulla in the left caudal lung (Figure 2). Tetracycline-resistant *Pasteurella multocida,* an important cause of bacterial pneumonia in cattle, was isolated in pure growth from lung tissue. Histopathology was consistent with a chronic active bronchopneumonia. The presence of bullae in the lung lobes is typical of bovine respiratory syncytial virus (BRSV). The multiplex PCR was negative for respiratory viruses however, the histopathology suggested a previous pneumotropic viral infection such as BRSV, PI3 and BHV-1.

Mycoplasma bovis and *Mycoplasma arginini* were also detected in the lung tissue. Pneumonia is the most common clinical disease presentation associated with *M. bovis* infection. The organism can cause disease as a sole pathogen, or more commonly in combination with other pathogenic respiratory bacteria, viruses, or parasites. Disease can occur in all ages of cattle in both beef and dairy systems but especially in younger animals. Further information about *M. bovis* can be found at: Mycoplamsa bovis: current knowledge, industry challenges and knowledge gaps for the UK cattle industry (defra.gov.uk).

M. arginini is generally thought to be a commensal, but there is increasing evidence of pathogenicity, especially when combined with other infections.

Figure 2: Antero-ventral lung consolidation and a large bulla in the left caudal lobe of a calf.

Musculoskeletal System

Chondrodystrophy in suckler calves

Chondrodystrophy has been linked to drought and poor-quality pasture in Australia. With the recent UK hot and dry weather, there could potentially be an increased risk of this in autumn-calving herds this year.

A suckler calf of three days of age was examined from a suckler herd where eight or nine apparently similarly affected calves were reported to have been born this year. The herd comprised 80 cows and 20 heifers. Three affected calves were born to the heifers, which all calved first. Later, similarly affected calves were born to the cows, some of which died at birth, others died before reaching a week of age. At the time of examination, the cows were being fed only grass silage, prior to which they received maize silage and fodder beet, with trace element boluses given during pregnancy. The calf which was submitted had shortened limbs, especially affecting the humerus and femur of each leg. A large atrial

septal defect and patent ductus arteriosus were also found postmortem. Histopathology confirmed lesions consistent with chondrodystrophy.

This condition is sporadically diagnosed, almost all cases being in suckler herds where the dams are fed a 100% or predominantly grass silage diet in early pregnancy. Although a nutritional cause was suspected, the exact aetiology is uncertain and probably multifactorial. Supplementary feeding to ensure that not >75% of the diet in early to mid-pregnancy comprises grass silage has successfully prevented further cases in affected herds in subsequent calving seasons.

Nervous system

Histophilus somni meningoencephalitis in a 12-month-old heifer

A 12-month-old dairy heifer was submitted for postmortem examination. The animal had been noticed to have lost condition, and it had been lame for a few days prior to being found recumbent and poorly responsive, and euthanasia was performed. The only postmortem findings of note were in the brain. The cerebral hemispheres were swollen and oedematous. Mucopurulent material was present at the caudal aspect of the cerebellum, on the ventral aspect of the brain stem and midbrain, and around the optic chiasma. *Histophilus somni* was isolated from the lesion and histopathology confirmed a severe multifocal to coalescing acute necrotising fibrinosuppurative meningoencephalitis, consistent with bacterial infection.

H. somni is most commonly associated with respiratory tract disease, however, systemic spread can also occur with infections identified within the heart or central nervous system in some animals. Reproductive tract disease is also occasionally recognised. What accounts for the different manifestations or tropisms of this organism is unclear, and although there is a vaccine available, prevention of disease can be problematic.

Joint III, meningitis and hypopyon due to Streptococcus gallolyticus in a calf

A 7-day-old pedigree Holstein heifer calf was the fourth to develop cloudy eyes and neurological signs over a 10-day period. The submitted calf never sucked and had been tube fed twice daily since birth. It had had diarrhoea and was positive for cryptosporidiosis on a snap-test. Gross postmortem findings included a thickened navel (with no evidence of navel treatment at birth), excess cloudy joint fluid in carpal and tarsal joints, cloudy meninges with overlying purulent material (Figure 3) and purulent material in the anterior chamber of both eyes.

ZST testing demonstrated failure of passive transfer. *Streptococcus gallolyticus* resistant to tetracycline and neomycin was cultured in systemic distribution, including the brain. *S. gallolyticus* is a common inhabitant of the rumen and farm environment and may cause opportunistic infection following breaching of the epithelial/mucosal barrier due to injury or

inflammation. The calf had navel ill, a potential portal of infection in this case. Cryptosporidium was also detected in faeces. A review of colostrum management and hygiene around calving was advised, including disinfection of navels soon after birth to control of neonatal disease.

Figure 3: Purulent material on the ventral surface of the brain of a calf.

Reproductive system - abortion

Escherichia fergusonii

Two abortions occurred over a period of a week, each in mid pregnancy, in a dairy herd of 280 cows. The second aborted calf was submitted for examination. It weighed only 3.7kg and exhibited no specific pathology, however its accompanying placenta had several thickened plaques in the intercotyledonary areas. *E. fergusonii*, a non-lactose fermenter which can be confused with Salmonellae (Bain and Green 1999), was isolated in heavy pure culture from the stomach content, and histopathology confirmed a suppurative placentitis associated with gram-negative coccobacilli, confirming the bacterial aetiology. *E. fergusonii* is an environmental organism which can occasionally cause opportunistic infections, including abortions and mastitis. It should only cause sporadic disease.

Bain MS, Green CC. Isolation of *Escherichia fergusonii* in cases clinically suggestive of salmonellosis. Veterinary Record 1999;144:511

Mycotic abortion

Five abortions were reported in a 340-cow dairy herd where *Salmonella* Mbandaka infections were previously identified. No placenta was received; however a pure culture of *Aspergillus fumigatus* was isolated from the stomach content of a 24kg aborted calf, indicating mycotic infection as the likely cause of abortion. Mycotic infection can occur at

any time during the year, although more incidents are generally diagnosed in the later housing and early spring period (Figure 4), reflecting the increased risk of feeding spoilt feed and access to contaminated bedding at this time. However, forage and bedding shortages later in 2022 may increase the risk of both this and *Bacillus licheniformis* abortions.

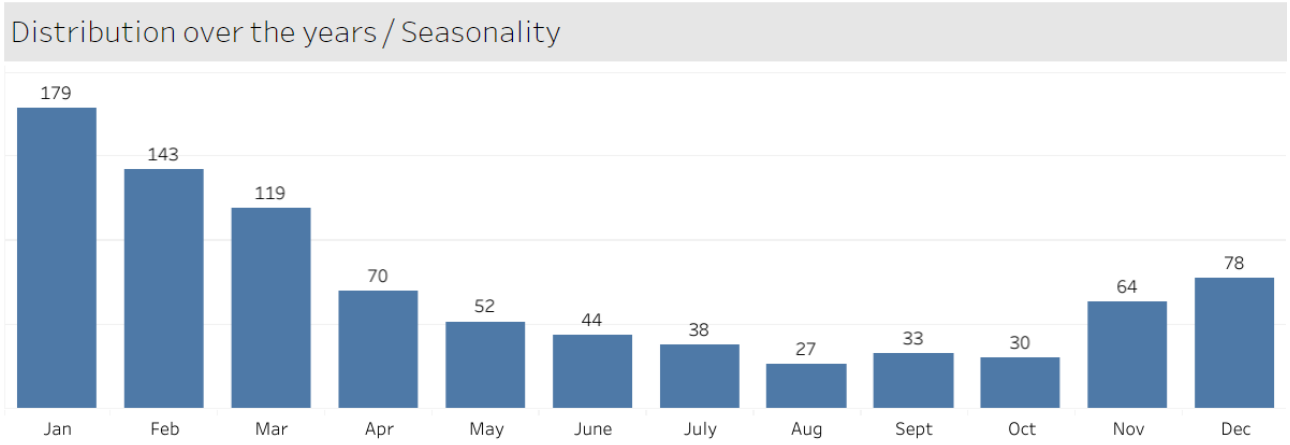

Figure 4: Fungal abortions in cattle in England and Wales 2002 to 2022

Bacillus licheniformis abortion and stillbirth

From a group of 100 late-gestation pedigree Aberdeen Angus cows, five had produced stillborn calves, typically two-weeks prior to the due date. Postal samples from a typical case were received and *Bacillus licheniformis* was isolated in pure growth from fetal stomach content.

A fetus was subsequently submitted from the same group after another dam aborted six-weeks early. The herd had a high health status for BVD, Leptospirosis, and Johne's Disease and the dams were given an iodine bolus prior to calving. The cows were being fed silage and hay out of round bale feeders; the silage being taken from a clamp using a shear grab. No visible mould was seen on the clamp face. Gross examination of the submitted fetus was unremarkable. Again, culture of fetal stomach content produced a pure, profuse growth of *Bacillus licheniformis*. This organism can cause abortions and can also play a role in stillbirths. Infection is typically associated with the feeding of poorly conserved or mouldy silage. A review of the feeding practices on farm was recommended. Tests for other infectious abortion agents were negative.

Bacillus licheniformis was also diagnosed as the cause of late term abortions, and stillbirths, in another suckler herd. Out of six calves born, only one was born alive. It was again isolated in purity from fetal stomach content.

Reproductive system – congenital deformities

Congenital chondrodysplasia resembling a ‘bulldog’ in a Welsh Black calf

A stillborn calf was submitted with its placenta to APHA Carmarthen. It had been born to a purchased heifer in a pedigree herd of 20 Welsh Blacks. The limb bones were markedly shortened, and the ribs and vertebrae were abnormally shaped (Figure 5). The skull was abnormally-shaped and this had caused compression of the hindbrain and spinal cord. There was also hydrocephalus. Other features included hypoplastic trachea and lungs, a globoid heart with ventricular hypertrophy, and a fibrotic liver. As hydrocephalus may be seen with *in utero* bluetongue virus infection, the case was reported to APHA Field Services as a bluetongue virus report case, which was negated by laboratory testing.

The features resembled those described for “bulldog” calves, a form of congenital chondrodysplasia reported in several breeds of cattle, but not previously in Welsh Blacks. A genetic cause has been established for several cattle breeds. It is most known for causing ‘bulldogs’ in the Dexter breed, where it has been attributed to mutations in the aggrecan (ACAN) gene, whose product is a protein integral to cartilage matrix (Cavanagh *et al*, 2007), and genetic testing for the mutant allele is available commercially. The same mutation has been identified as the cause of bulldog-type lethal dwarfism in miniature Scottish Highland and miniature Belted Galloway calves in New Zealand (Dittmer *et al,* 2017).

In these breeds an autosomal recessive pattern of inheritance has been demonstrated and genetic testing of breeding stock is warranted. In contrast, investigation of a series of Holstein calves with lethal bulldog-type dwarfism by Agerholm *et al* (2016) identified a mutation in the COL2A1 gene (collagen synthesis); all affected calves were sired by the same bull and the defect was determined to have arisen in the sire’s germline. Because the defect was lethal, with a dominant inheritance pattern, there was no risk of onward transmission of the deleterious mutation. Other forms of chondrodysplasia and dwarfism in cattle are considered to have genetic, nutritional, multifactorial, or undetermined aetiology; these have a less severe phenotype than that recorded in this case.

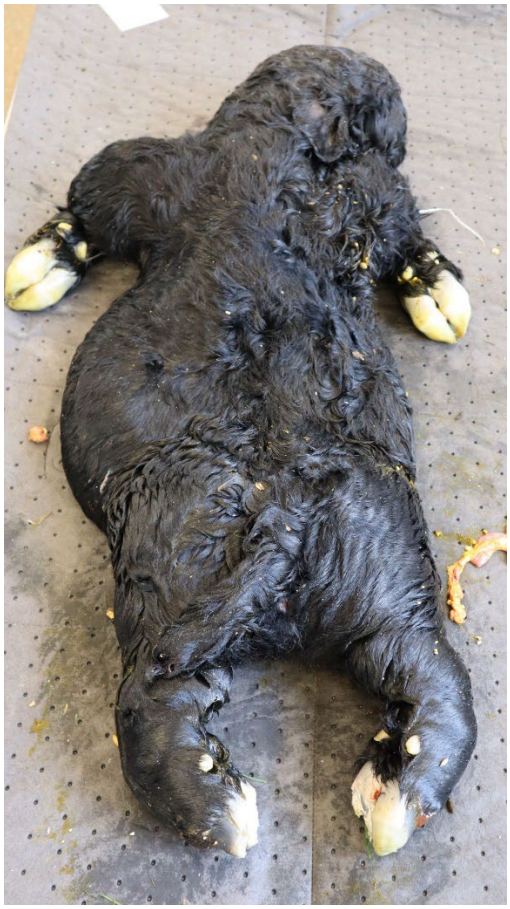

Figure 5: Chondrodysplastic “bulldog” calf.

‘Squinty jaw’ (asymmetrical mandibular malalignment)

Further reports of ‘squinty jaw’ (asymmetrical mandibular malalignment) were made from three separate veterinary practices in Scotland (two in Aberdeenshire, one in Ayr). The details of these three cases are still under investigation. The Farmers Weekly ran an article in February which may have increased awareness. The Cattle Expert Group would be interested to hear about cases of ‘squinty jaw’.

Reproductive system – stillbirths

A stillbirth investigation

Postmortem examination can assist in determining between an abortion and a stillbirth. In stillborn calves it can also help indicate the stage of labour at which the calf died, and the most likely cause, or causes. These extra pieces of information on the likely aetiology of the stillbirth help in the review of management practices on the affected farm around calving time.

A stillborn calf was submitted for postmortem examination, the third stillborn in a group of 15 maiden heifers. Second stage labour was first observed at 7pm and delivery occurred

at 8:30 pm. No assistance was given. The farmer reported the calf was dead at birth. The heifers were fed on silage and were reported to be possibly over condition.

The significant postmortem examination findings were: the absence of a blood clot in the umbilical artery suggesting death occurred during second stage labour; petechial haemorrhages on the epicardium and spleen, and brain congestion consistent with anoxia; and oedema and haemorrhages on the head, ribs and diaphragm suggesting bradytocia.

Histopathology confirmed aspiration of meconium and the presence of squames in the lung which is common in aborted and stillborn calves and indicates a period of fetal distress. There were no other significant histopathological changes, and the thyroid weight was within normal parameters. The calf was not large and therefore fetal oversize was not thought to be a contributing factor. The history suggested that the over condition of the heifers may have contributed to the suspected bradytocia. It was recommended to review heifer nutrition on the farm.

Geraghty T, Mee J, Murphy A, Orr J. How to investigate a stillbirth on farm. *In Practice* 2021; 43:373-387

Iodine deficiency in suckler calves

A calf which was born alive, and suspected to be premature, died a few hours later and was submitted for postmortem examination. One other calf had died in the group of 12 cows, in a herd with 80 breeding animals. The only notable finding in the 31kg calf was an enlarged thyroid which weighed 35.4 grams The normal weight should be <0.03% of bodyweight, although larger thyroids can be found in normal calves and more specific analysis by histopathology and/or iodine analysis is recommended. No significant infectious agents were identified, and on histopathology marked thyroid hyperplasia was confirmed. Iodine supplementation was advised.

Centre of Expertise for Extensively Managed Livestock

The CoEEML was developed by APHA to address potential surveillance gaps for extensively managed animals. Extensive management of livestock potentially makes regular or close inspection for disease detection more challenging. The Centre is based at the APHA Veterinary Investigation Centre in Carmarthen; however, it is a Great Britain-wide resource and forms part of the wider veterinary surveillance system operated by APHA.

One of the topics investigated by the CoEEML is liver fluke. A funded project ‘Hill Sheep Health North’ was recently the subject of a Vet Record focus article on this topic: [Managing liver fluke on hill farms (wiley.com)]

Chemical food safety

The latest chemical food safety report can be found at:

Chemical food safety quarterly report: April to June 2022 - GOV.UK (www.gov.uk)

Four toxicology cases were reported over this quarter for cattle in England and Wales, three of which were lead toxicity and the other of which was botulism.

Horizon scanning

Bluetongue (BTV) update

APHA no longer has access to the EU's Animal Disease Notification System (ADNS), hence we are now using World Organisation for Animal Health (WOAH) data instead.

Amongst countries in northern and western Europe, the following areas are currently classified by the European Commission as containing circulating BTV-8 (see Figure 6):

mainland France (since 01 January 2018), Belgium (since 01 April 2019), Luxembourg (since 17 September 2020), Switzerland (since 20 April 2021), and Germany (only the states of Saarland and Rhineland-Palatinate; since 14 July 2022).

Amongst these, mainland France is also considered to contain circulating BTV-4.

We will continue to monitor this situation.

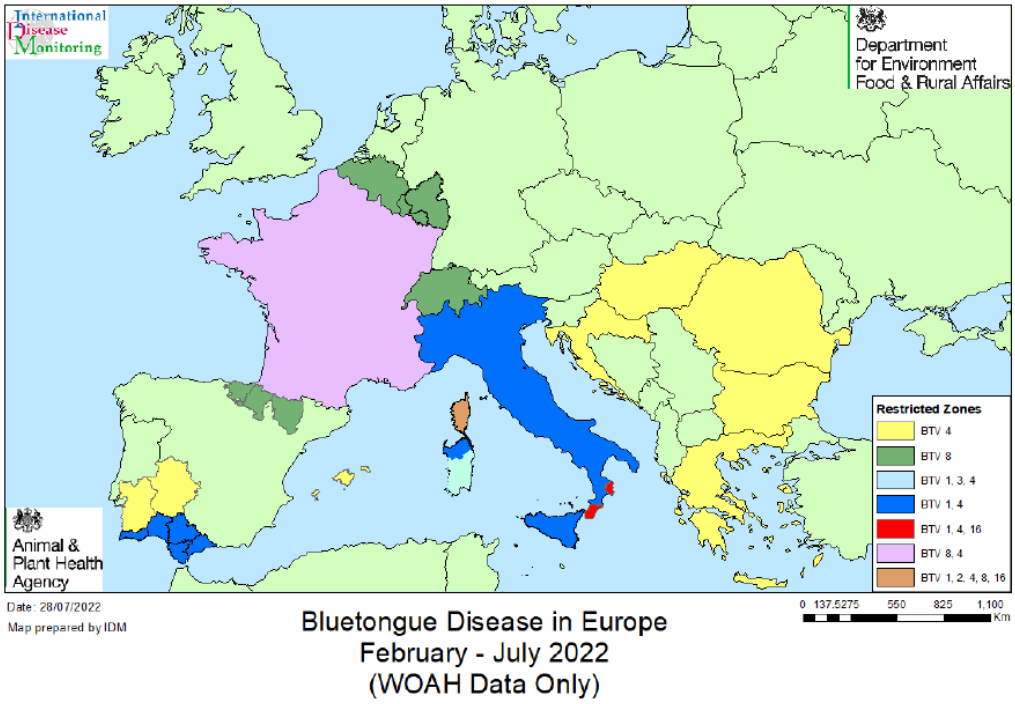

Figure 6: Map of Europe showing BTV restriction zones February 2022 to July 2022

For more information, see our BTV Outbreak Assessment on GOV.UK

APHA have released a series of animations on Facebook and Twitter to inform keepers of BTV. https://www.facebook.com/APHAGov/

Foot and Mouth Disease (FMD)

In June, the FMD outbreaks that were reported were: serotype O in China (2), Indonesia (17) and Israel (21); serotype SAT 2 in South Africa (5); serotype SAT 3 in South Africa (6).

Of particular concern are the outbreaks reported in Indonesia. In June, Indonesia reported 17 outbreaks of FMD (serotype O). All outbreaks were reported on village premises. Four premises contained cattle only, the largest of which contained over 2,000 animals. The remaining outbreaks were on mixed species premises containing cattle, goats, sheep, and buffalo (one mixed species premises also contained pigs). One mixed species premises contained over 20,000 animals, two contained over 10,000 animals and three contained over 2,000 animals. With FMD recently found in the tourist hotspot of Bali, Australia and New Zealand have increased their biosecurity arrangements.

Recent measures to protect against FMD in New Zealand, include:

- A new wide-reaching awareness campaign targeting travellers before they travel to Indonesia, through in-flight announcements and on arrival at international airports.
- An on-the-ground audit of the palm kernel supply chain in Indonesia.

- Biosecurity New Zealand is launching an FMD Readiness Taskforce to ensure all their preparedness work is refreshed.
- Providing regular updates to primary sector partners and the country's veterinary network and, working with primary sector partners to ensure their farmers remain vigilant.
- Providing personal protective equipment, disinfectant, backpack sprayers and other tools to Indonesia to help on the ground, as well as their technical expertise.

In Australia, legislation has been brought in to strengthen border activities and, new measures have been imposed to help prevent an incursion. These include:

- Assistance offered to Indonesian authorities to combat and contain the outbreak. They have offered advice from Australian technical experts, supply of vaccines, and offers of financial support. This is in addition to assistance already being provided to combat lumpy skin disease, which was recently detected in Sumatra.
- Reviewed import permits for animal products from Indonesia which may carry FMD, and suspension of those of concern.
- Awareness campaigns to Australia's livestock producers and agriculture industries, travellers, and a range of other stakeholders. They are closely engaged with their livestock industries and, continue to brief on both FMD and lumpy skin disease.
- Stronger clearance requirements for travellers entering through their airports.
- Increased screening for risk goods coming through their international mail centres.
- Increased disease surveillance across Australia's Top End (Western Australia, Northern Territory and north Queensland).

For more details on the situation in South East Asia, please see our latest Outbreak Assessment

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Statement regarding use of this material

This publication is available at:

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