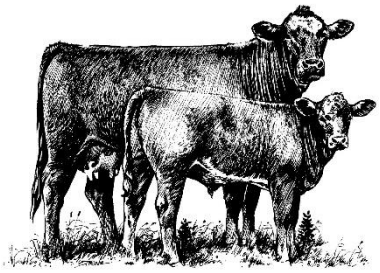
Animal & Plant Health Agency



SRUC

GB cattle quarterly report

Disease surveillance and emerging threats

Volume 27: Quarter 3 (July to September) 2023

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Introduction and overview

This quarterly report reviews disease trends and disease threats for the third quarter of 2023 (Quarter 3), 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 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

Dairy update

- **Prices:** UK farmgate milk prices averaged 36.36 pence per litre (ppl) in September, which was down 0.28ppl (-0.8%) from where they ended the last quarter in June. Cuts to milk prices have continued throughout Q3, albeit at a slower rate to those seen in the previous quarter. Although inflationary pressure has been easing on some inputs such as energy, feed and fuel, farm input costs remain historically high and the increase in interest rates is providing a challenge to working capital on farms.
- **Production:** UK milk production lowered in September, the first month this year to see milk delivery volumes behind those of last year, down -1.2%. We estimate that 3,574 million litres of milk were produced in the 3 months July – September, bringing the total volume for the year to date to an estimated 11.29 billion litres, -0.6% behind 2022.
- **Trade:** Year-to-date (Jan-Aug) volumes of dairy exports from the UK totalled 856Kt, a 0.6% increase compared to the same period in 2022. The value of these exports has increased by 3.8% to £1.26 billion, driven by inflation.
- **Demand:** In the 52 weeks ending 7 October, volumes purchased of all dairy product categories except cream were down year on year. Cream has seen volumes increase 1.3% meanwhile butter saw the largest decline of -4.0%. Milk, cheese and yoghurt saw volumes ease between 2.1-2.8%. All product categories have seen prices rise between 10-20%. (Copyright © 2023 Nielsen Consumer LLC. All Rights Reserved.)

Beef update

- **Prices:** Following pressure through July and August, GB deadweight prime cattle prices ended Q3 closer to how they began, with the all-prime average price rising to 478p/kg for the week ending 30 Sep. Cull cow prices followed a similar pattern, dropping from 368p/kg to 313p/kg at the end of Aug before rising to 333p/kg for the week ending 30 Sep. Since then, cow prices have come under more pressure.
- **Production:** UK beef production totalled 70,700 tonnes in September, down 2% year-on-year, having been below 2022 levels throughout the quarter. Decreased

cattle slaughterings drove the decline, with prime cattle kill down 0.9% YOY, and cow kill down 5.3%. For the year-to-date (Jan-Sep), prime cattle kill has totalled 1.5m head (-0.6% YOY), with cow kill at 442k head (+2.1% YOY).

- **Trade:** In terms of UK beef trade, imports of fresh & frozen beef totalled 18,100 tonnes in August, down 2% YOY. Export volumes sat at 8,100 tonnes for the month, down 16% YOY. UK exports have been pressured by their high price point on the continent and weaker EU demand. For the YTD (Jan-Aug) beef imports stood at 146,300 tonnes (-4% YOY), while exports totalled 66,400 tonnes (-21% YOY).
- **Demand**: In the 12 weeks to 1 October, spend on beef in retail was up 9.3% YOY, while volumes were down by 1%. Average prices paid were up 10.4% as inflation causes price rises. Mince, total steaks and sliced cooked meats were in volume growth, while burgers and grills saw notable volume losses on-the-year.

Acknowledgment for the dairy and beef updates: Freya Shuttleworth, AHDB

Cattle disease surveillance dashboard outputs

The most frequent diagnoses from carcase submissions made in the third quarter (Q3) of 2023, compared to Q3 in 2022, and Q3 for 2015 to 2023 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 carcase submission diagnoses in Q3 of2023, Q3 of 2022, and Q3 for 2015-2023

10 most frequent carcase diagnoses Q3 2023	10 most frequent carcase diagnoses Q3 2022	10 most frequent carcase diagnoses Q3 2015-2023
1. Digestive disease due to other causes (not listed) *	1. Digestive disease due to other causes (not listed)	1. Digestive disease due to other causes (not listed)
2. Pneumonia due to *Mycoplasma bovis*	2. Parasitic pneumonia (lungworm)	2. Pneumonia – other cause not listed
3. Ruminal acidosis	3. Pneumonia due to *Mycoplasma bovis*	3. Pneumonia due to *Mycoplasma bovis*
4. Salmonellosis due to S. Dublin	4. Pneumonia – other cause not listed	4. Salmonellosis due to S. Dublin
5. Pneumonia due to *Pasteurella multocida*	5. Colisepticaemia	5. Pneumonia due to *Pasteurella multocida*

6. Pneumonia – other cause (not listed)**	6. Pneumonia due to *Pasteurella multocida*	6. Cryptosporidiosis
7. Systemic disease due to other causes (not listed)***	7. Systemic disease due to other causes (not listed)	7. Parasitic pneumonia (lungworm)
8 Parasitic gastroenteritis	8. Pneumonia due to *Mannheimia haemolytica*	8. Pneumonia due to *Mannheimia haemolytica*
9. Parasitic pneumonia (lungworm)	9. Coccidiosis	9. Coccidiosis
10. Pneumonia due to *Haemophilus somni*	10. Cryptosporidiosis	10. Colisepticaemia

This quarter, the diagnoses of 'digestive disease due to other causes, not listed' **(*)** included enteric yersiniosis, chronic enteritis +/- dysbiosis (often with histopathological evidence suggesting a previous coccidial, or parasitic gastroenteritis, insult), entrapment or rupture of intestine, and ruminal impaction.

For Q3 2023, the other causes of pneumonia **(**)** included aspiration pneumonia, embolic pneumonia associated with udder cleft dermatitis or portocaval thromboembolism, pneumonia associated with *Streptococcus suis*, and pneumonia where *Mycoplasma dispar* was detected and likely to have been significant.

If the data for Q3 2023 includes all submission types (not just carcase submissions), then the top five diagnoses for Q3 2023 were (from 1 to 5): Johne's Disease, lungworm, parasitic gastroenteritis, coccidiosis, and salmonellosis due to S. Dublin.

New and re-emerging diseases and threats

Bluetongue virus (BTV) update

Since the Q2 2023 report, there have been outbreaks of BTV-3 in the Netherlands and new outbreaks of BTV-8 in France. At the time of writing there have also been 11 confirmed cases of BTV-3 in England. Bluetongue affects sheep, cattle, other ruminants such as deer and goats, and camelids such as llamas and alpaca.

In England, one case was confirmed in Kent in early November 2023. Following active surveillance within the 10km temporary control zone (TCZ) of the first case, a further seven BTV-3 cases in cattle, and one in a sheep, were identified, all within the 10km TCZ and within 5km of the first finding near Canterbury, Kent. All nine animals were humanely culled to reduce the risk of onward transmission. During November 2023, there was no evidence that there was circulating virus in the midge population, and the

10km TCZ remained in place, with surveillance ongoing. Two cases were also detected in Norfolk in cattle, also with no evidence of circulating virus in the midge population.

All species of ruminants are susceptible to Bluetongue virus (BTV) infections. The main transmission cycle involves the Culicoides midge as a vector, and disease usually coincides with high vector populations, in late summer and autumn. Cattle are the main carriers of BTV. Infected cattle may show no, or few, clinical signs. Clinical signs in cattle may include lethargy, crusting erosions of the muzzle, hyperaemia of the coronary band, pyrexia, milk drop, teat erosions, abortion, and foetal deformity.

Clinical signs in sheep include a swollen head, oral ulceration, excess salivation, nasal discharge, hyperaemia of the coronary band, lameness, pyrexia, respiratory distress, abortion, and foetal deformity.

In-utero infection of ruminants can result in hydranencephaly, which is why all stillborn or aborted ruminant foetuses received at the veterinary investigation centres have a gross examination of the brain. If you see brain lesions whilst undertaking an on-farm abortion or neonatal ruminant postmortem examination, the findings should be reported to the APHA field team, who will investigate, and arrange for sampling and disease control measures if appropriate. To report such cases, please call the **Defra Rural Services Helpline** on **03000 200301.**

The links below give further information on BTV and the current situation:

- BCVA have shared some useful images and a video clip from the Netherlands on their website: Bluetongue Vigilance Called - UK Case Confirmed | BCVA
- As well as the information on Gov.uk, the Ruminant Health & Welfare website has some regularly updated information for vets and farmers: Bluetongue Virus - Ruminant Health & Welfare (ruminanthw.org.uk)
- Reminder to report suspect cases: Bluetongue: how to spot and report the disease - GOV.UK (www.gov.uk)
- Reminder of clinical signs: Differential diagnosis of bluetongue in cattle and sheep - Williamson - 2008 - In Practice - Wiley Online Library
- Bluetongue virus serotype 8 in sheep and cattle: a clinical update - Dercksen - 2007 - In Practice - Wiley Online Library
- Images on FLICKR: Bluetongue disease: clinical signs | Flickr
- YouTube - Bluetongue transmission clinical signs and pathology in sheep

Contamination of pasture and forage with lead shot and lead poisoning risk

Two cases of acute lead toxicity, one in fattening cattle and the second in finishing lambs, have highlighted the potential risk posed by lead shot when ingested by livestock. The primary risks are the impact on animal health, including mortality; food safety; and the potential for considerable financial loss (lost production and additional ancillary costs).

The first case involved finishing cattle provided with maize silage, which was contaminated with lead shot. The maize had been grown adjacent to a clay pigeon shoot, which was

described as a lead-free shoot. Maize crops are often grown adjacent to clay pigeon establishments (Figure 1). Large amounts of lead shot landed on the silage and was ensiled when harvested. Acute lead poisoning was displayed by the cattle and lead shot was visible in the rumen contents at post-mortem. A total of 48 cattle were lost, 26 dying from acute lead toxicity and the remainder culled due to unmanageable residue levels.

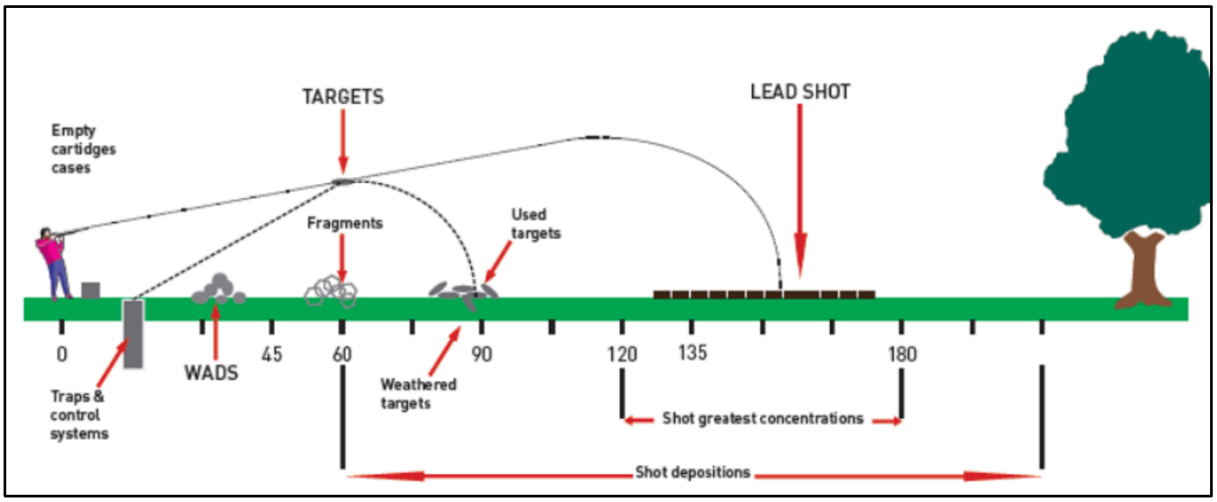

Figure 1: Diagram representing the likely mechanism of lead shot contamination of pasture

In the second case involving fattening lambs, a group of 170 lambs had been turned out onto a grazing area adjacent to a clay pigeon shoot. The shoot had been in operation for several years and no issues had been noted previously. The lambs started to display vague malaise with ten deaths over a two-week period. Lead toxicity was diagnosed, and the entire group were moved to fresh pasture. As their lead status was undetermined, they were placed under restrictions and prevented from entering the food chain. Additional screening by blood sampling at the owner's expense established the lead levels in the lambs. They were allowed to enter the food chain under the proviso that all offal was discarded. The landowner has decided to adapt the contaminated grazing area into a wildlife meadow.

Changes in disease patterns and unusual diagnoses

Systemic disease

Salmonellosis cases

Salmonellosis outbreaks are frequently reported in cattle, where *Salmonella* Dublin infection is most often confirmed (Figure 2). The most common serovars in cattle in 2022 were S. Dublin (61.6% of isolations), followed by S. Mbandaka (13.7% of isolations), S. Typhimurium (13.5% of isolations) and S. Montevideo (4.2% of isolations). *S*. Dublin infection is diagnosed throughout the year but is more commonly seen in the late summer and autumn (Figure 3).

Three outbreaks of abortion due to S. Dublin were confirmed at APHA Shrewsbury in July. Disease may occur in only one age group, however in some herds, adult cows and calves

have been affected. A recent example was a dairy herd in southwest England where *S*. Dublin was cultured from a six-month gestation aborted foetus, submitted from a dairy herd of 220 cows. This was the sixth abortion over a period of one month. Some of the affected dams were reported to be unwell after aborting, and there was also malaise and pyrexia in calves of seven to 10-days-old.

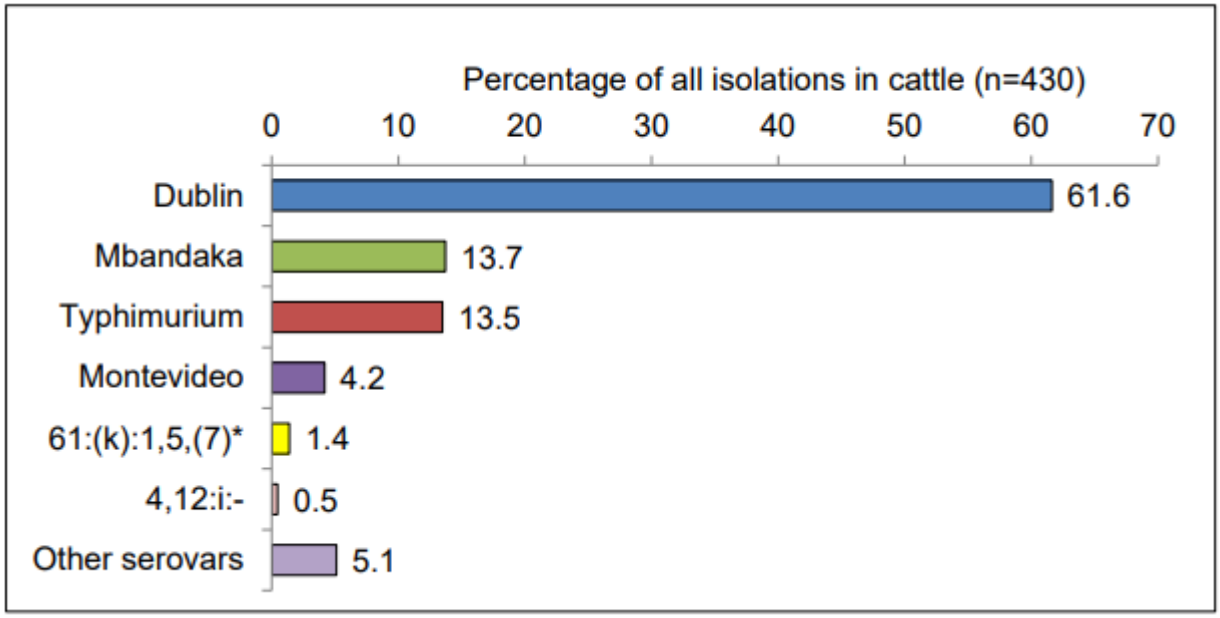

Figure 2: Graph taken from the 'Salmonella in animals and feed in Great Britain' 2022 report, showing *Salmonella* Dublin as the most common Salmonella isolated in cattle

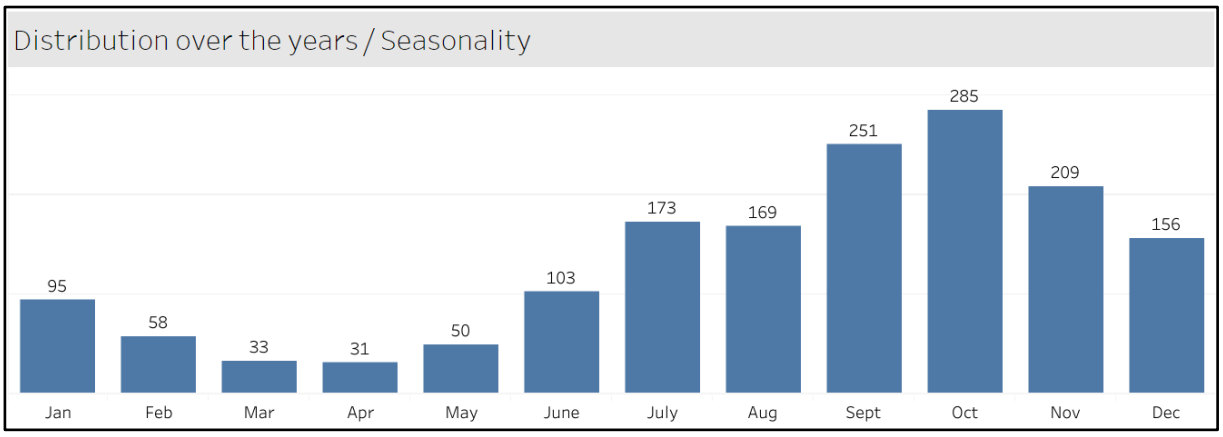

Figure 3: Seasonality of S. Dublin in cattle, between 2015 and 2022

Two 20-day-old calves were submitted to Starcross Veterinary Investigation Centre from another herd, to investigate pyrexia, malaise and scour affecting 15 of a group of 100. Both were dehydrated and had orange-coloured livers, one also had bloody enteritis (Figure 4). *S.* Dublin was cultured from intestinal contents, liver, and lung of each calf.

SRUC Ayr diagnosed a *Salmonella* Dublin outbreak in a herd from which multiple samples were submitted, and from which S. Dublin was isolated in all. One six-day old calf was euthanased and submitted following a one-month history of several calves developing

pneumonia type symptoms, some of which responded to antibiotic treatment while others became recumbent and died. In this carcase, faecal staining was evident, and there was bilateral lung consolidation. S. Dublin was isolated from the liver and spleen. S. Dublin was also isolated in a pure growth from the foetal stomach contents of two aborted foetuses that were sampled on farm. The dams had developed diarrhoea and pyrexia.

Figure 4: Reddened small intestine in a calf with Salmonella Dublin

Salmonellae can be introduced to naïve herds by several routes; through the purchase of carrier animals, or contact with faeces, feed contamination, sharing vehicles or equipment, and, also through personnel moving between farms. Preventing disease requires a holistic approach including improved hygiene, especially in the calving environment, and isolating affected animals. A commercial vaccine may be used on farms where *S*. Dublin or *S*. Typhimurium infection is identified, as part of a disease control plan.

As shown in Figure 2, the second most common Salmonella in cattle is *S*. Mbandaka. This organism has emerged over recent years and is thought to have originally been introduced in feed such as straights. It is mostly associated with enteritis in adults or youngstock, though occasionally also causes abortion. The third most prevalent Salmonella species in cattle is *S*. Typhimurium, with several variants identified, some of which exhibit resistance to several antibiotics. This organism is similarly chiefly associated with enteritis, and occasionally abortions; it can spread between species and is also more commonly associated with zoonotic disease.

All salmonellosis incidents must be reported under the Zoonoses Order 1989; to enable a risk assessment to be made. Details are also shared with the medical authorities.

A review *Salmonella* Dublin infection was published by Henderson and Mason (2017): [Diagnosis and control of Salmonella Dublin in dairy herds - Henderson - 2017 - In Practice - Wiley Online Library]

The 2022 edition of the *Salmonella* in animals and feed in Great Britain (previously called *Salmonella* in Livestock Production in GB) has been published and is now available here: Salmonella in animals and feed in Great Britain - GOV.UK (www.gov.uk)

Portocaval thromboembolism

Thromboembolism is regularly diagnosed postmortem in cattle which are examined at Veterinary Investigation Centres (VICs) in England and Wales. Although most occur in adult dairy cows, youngstock, especially those on high concentrate rations, may also be affected.

A recent case at Starcross was identified in a dairy herd of 600 adult cattle. A dairy cow, which was the second to die following pyrexia, milk drop and respiratory signs, was submitted for postmortem examination (PME). Each of the cows had failed to improve after treatment with oxytetracycline and meloxicam. There were two large abscesses within the liver, near the posterior vena cava, and random consolidation throughout all the lung lobes with small abscesses within the caudal lobes. The rumen liquor pH was 5.3, supporting suspicion that rumenitis, caused by acidosis, was the source of the hepatic abscesses, with subsequent dissemination to the lungs.

In a case at Shrewsbury, a 26-month-old fattener was received from an approved finishing unit. Another animal in the group of 28 was similarly found dead a few days earlier, and there was low grade coughing in others. All had been purchased from a single farm 24 days previously. There were several hepatic abscesses, one having eroded into the posterior vena cava (Figure 5), and widespread pulmonary consolidation. The lesions in the liver were chronic and had most likely developed at the farm of origin.

In addition to rumenitis caused by acidosis, which damages the rumen mucosa allowing bacteria into the portal circulation, other potential sources of the emboli in lungs include lesions of ‘udder cleft dermatitis’ (UCD), necropurulent foot or leg lesions, and contaminated injection sites. Animals with pulmonary thromboembolism may exhibit increased respiratory effort, coughing or bleeding from the nose, although some reportedly die without prior signs of illness.

To date there have been 10 diagnoses of portocaval thromboembolism in 2023, compared with six for the whole of 2022. These are probably the ‘tip of the iceberg’, as this condition can only be recognised at postmortem examination. Identifying the cause is important; where rumenitis or acidosis is suspected, the diet and feeding management of the cattle should be reviewed, and practitioners should also consider this potentially fatal outcome for herds with sub-acute rumen acidosis.

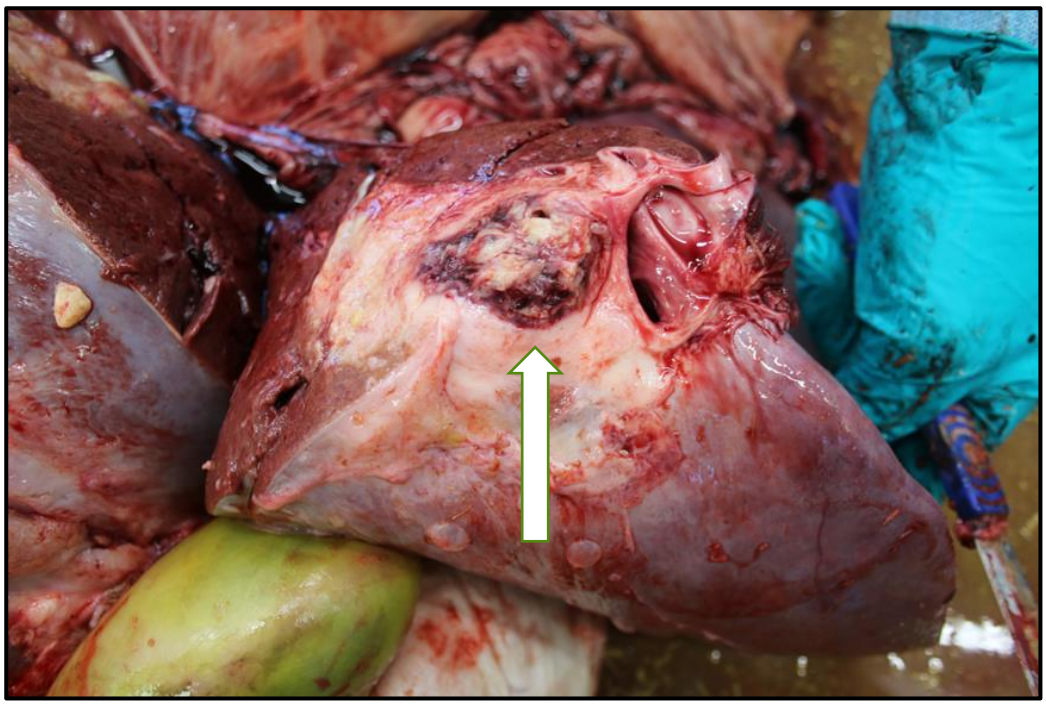

Figure 5: A hepatic abscess (arrowed) which had eroded into the posterior vena cava in a fattener with portocaval thromboembolism

Submissions to the pan-piroplasm (bovine babesiosis) and *Anaplasma phagoctytophilum* testing scheme

Seven submissions from separate holdings were sent in this quarter for pan-piroplasm and *A. phagocytophilum* testing; five were from Cornwall, one from Devon and one from Somerset.

1. A 14-month-old heifer was being reared on pasture known to be risky for Babesiosis. It was one of three in a group of 12 to present with malaise, anaemia, and haematuria; and was positive for *B. divergens.*
2. A six-year-old dairy cow with haematuria was positive for *B. divergens.*
3. A two-year-old beef finisher was found weak and exercise intolerant with haematuria and was positive for *B. divergens.*
4. A five-year old suckler cow, one in a group of 50, was found recumbent with a subnormal temperature and constipation but without clinical signs of anaemia. She responded to treatment with calcium and magnesium. She had attached ticks and was positive for *B. divergens.*
5. A 28-month-old Devon cross beef finisher presented with malaise and tested positive for *A. phagocytophilum.*
6. A 10-month-old steer presented with malaise and inappetence two months after turnout onto Dartmoor. Both *B. divergens* and *A. phagocytophilum* were detected. Coinfections can increase the severity of disease.
7. Three adult dairy cows were tested from a group of 100 at grass that were not thriving. One of the cows was anaemic and tested positive for *B. divergens.* A second cow that had malaise but not anaemia tested positive for *A. phagocytophilum.*

We would like to thank everyone who has submitted samples for the scheme over the past couple of years. Free of charge testing has now ended but the test is available (TC0324) for £36.80 (ex VAT), and we will still consider testing interesting and/or unusual cases free of charge, so do get in contact with us to discuss. Harriet MacFadzean analysed the 2021 submissions for the distribution and risk factors for Bovine Babesiosis and you can read her conclusions in this recently published, open access paper Animals | Free Full-Text | Surveillance and Risk Analysis for Bovine Babesiosis in England and Wales to Inform Disease Distribution (mdpi.com). The study reported a widespread distribution for *B. divergens*, although the South West region was overrepresented. No other cattle *Babesia spp.* were detected in the samples. Coinfection with *A. phagocytophilum* was reported in 11% of the *B. divergens* positive samples. Positive submissions were most frequent between June and September, reflecting the extended seasonality now observed in the activity of the tick vector *Ixodes Ricinus.*

Hypomagnesaemia in two suckler cows

The carcases of two adult suckler cows were submitted, following negative anthrax tests, to investigate the cause of sudden death at grass. Multiple haemorrhages were found throughout the carcasses on gross postmortem examination, which was suggestive of hypomagnesaemia as the cause of death. Magnesium concentration in the aqueous humour was 0.38mmol/l in Cow 1 and 0.42 mmol/l in Cow 2. The reference range is 0.8 – 2.0 mmol/l, and therefore a diagnosis of hypomagnesaemia was confirmed in both cows.

Hypovitaminosis A and recumbency in a steer

A 16-month-old home-bred Limousin steer was submitted to investigate blindness and recumbency. It had become pyrexic with malaise about two weeks previously and then, while still eating and drinking, it became sternally recumbent and non-responsive to treatment. The farmer also reported that two other steers from the same group went blind, with no eye lesions, about six weeks earlier and confirmed that the cases were from different breeds and genetic lines. The steers were in a straw yard and had not been at pasture for several months. They were fed an unspecified grain mill mix ad-libitum, and twice daily washed reject potatoes, but received no vitamin or mineral supplementation.

Gross lesions identified at postmortem examination included osteomyelitis in C2 vertebra (Figure 6) and there was severe chronic arthritis, with secondary infection, in the left stifle; and lower grade inflammation in the right stifle and one elbow.

The blood vitamin A level was < 20µg/l (reference value: 249.21-501.29 µg/l), confirming hypovitaminosis A in the submitted steer, which is significant as a cause of blindness.

Green fodder is important to prevent hypovitaminosis A. It was likely that the drought observed during the pasture period, and subsequent absence of green feed at housing, had led to chronic decline in stores of vitamin A in the group.

Figure 6: Longitudinal section through the C2 vertebra, showing osteomyelitis, in a steer with hypovitaminosis A

Digestive system disease

Traumatic reticuloperitonitis in a dairy cow

An eight-year-old dairy cow had been losing weight for some weeks since she aborted. She died and was submitted for PME. Another 5-10 cows, approximately 5% of the herd, had also been losing condition. On PME, a large quantity purulent material was found adhered to the abdominal surface of the diaphragm, the body wall, and free within the abdomen. The diaphragm itself was thickened and inflamed, and a tyre wire was seen protruding from it, surrounded by inflammatory material (Figure 7), confirming a diagnosis of traumatic reticuloperitonitis (‘tyre wire disease’). Traumatic reticuloperitonitis continues to be a fairly common diagnosis in adult dairy cows that are submitted to the APHA Starcross, with seven cases so far in 2023. This is despite the risks of using tyres to sheet down silage clamps being well recognised.

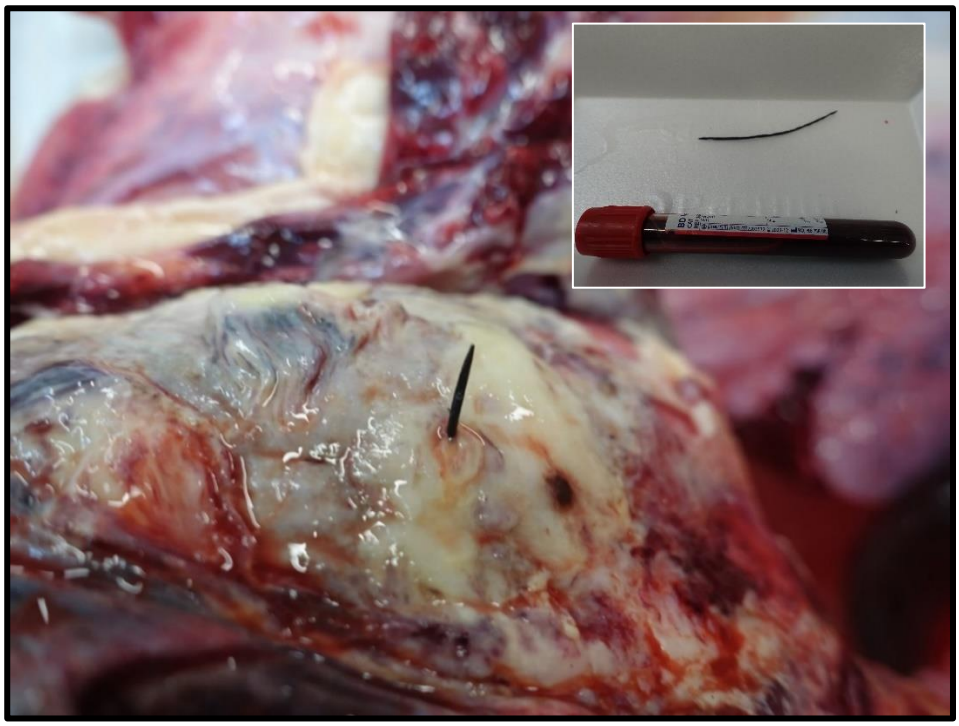

Figure 7: Tyre wire protruding from the diaphragm in a cow with traumatic reticuloperitonitis (inset shows extracted wire for size reference)

Coccidiosis in six-week-old dairy heifers

Coccidiosis continues to be a common diagnosis from submissions (including postal submissions). Two six-week-old calves were submitted having died less than 12 hours after appearing unwell. Both calves had dark black diarrhoea prior to death. The group had been treated for coccidiosis about three weeks previously. At PME, both calves had diarrhoea and were dehydrated. Calf 1 had typhlitis and colitis, with gross findings less severe in Calf 2. Both calves had high faecal coccidial oocyst counts with 98% confirmed as pathogenic species, *Eimeria bovis* and *Eimeria zuernii* (Tables 2 & 3).

Table 2: Faecal egg count results for two calves with coccidiosis

Test	CALF 1 (Faeces)	CALF 2 (Faeces)
Sample Consistency(†)	Liquid	Liquid
Trichostrongyle-type eggs (per g)(p1)	<50	<50
Coccidial oocysts (per g)	47500	322000

Table 3: Coccidial oocyst speciation results for the two calves with coccidiosis

Test	CALF 1 (Faeces)	CALF 2 (Faeces)
E. bovis %(†)	81	85
E. zuernii %(†)	17	13
E. alabamensis %(†)		1
E. auburnensis %(†)		1
E. ellipsoidalis %(†)	2	

Coccidiosis is caused by infection with *Eimeria* spp in cattle, mainly *E. zuerni* and *E. bovis* but occasionally *E. alabamensis* and *E. ellispoidalis.* Calves of three weeks to six months of age are most susceptible. It is predominantly a disease of housed animals and is usually associated with unhygienic/overcrowded conditions. Moisture and a cool temperature encourage sporulation of the oocysts. Most animals in a group become infected, but often only 10% to 25% of animals develop clinical disease. The incubation period for coccidiosis varies with the species of coccidia but is usually between 16 days to 30 days. It is unlikely that the oocysts of pathogenic species will be detected in calves of a younger age. The excretion of oocysts is intermittent and varies depending on the species of coccidia, the age of the animal and the degree of immunity.

Treatment of the group was recommended, and it was advised a coccidiosis control plan should be implemented. Oocysts are resistant to many disinfectants, except to those with proven oocidal action. Control relies on maintaining a clean, dry environment and avoiding overcrowding and stress.

Parasitic gastroenteritis (PGE)

Faecal samples from a group of dairy heifers aged around 6 months had evidence of significant parasite burdens, with worm egg counts ranging from 100 epg in liquid faeces to 3350 epg in soft faeces. On another dairy premises poor condition and scouring were reported in one of a group of 20 diary heifers aged 9 months, and faecal samples were submitted. A count of 1900 epg was identified in liquid faeces. On reporting of these results, it was noted that the consistency of faeces samples can affect the egg counts though a ‘dilution effect’ if they are liquid. Furthermore, it was important not to overlook low counts in cattle, as significant parasite burdens can be present in animals which are passing very low egg counts, and further investigation and monitoring is recommended.

High numbers of *Ostertagia* sp. and *Trichostrongylus axei* worms were detected in the abomasal content of a calf submitted for PME. Grossly, there was nodular thickening of the abomasal mucosa (Figure 8). Histopathology confirmed parasitic abomasitis. A moderate worm burden was also found in the other calf that was submitted from the same group. Anthelmintic treatment was recommended for the group.

Figure 8: Nodular thickening of abomasal mucosa in a calf with plant poisoning and parasitic gastroenteritis

Johne's disease in a freshly calved cow

Johne's disease was the commonest diagnosis from postal submissions this quarter. In addition, a six-year-old dairy cow was euthanased and submitted to investigate the cause of scouring and deaths in freshly calved cows over the previous eight months. At PME the gross findings were poor bodily condition, diarrhoea, and thickening and corrugation of the jejunal and ileal mucosa (Figure 9). Testing of faeces by Johne's PCR was positive for DNA indicative of *Mycobacterium avium* subsp. *paratuberculosis*. Together with the clinical signs described and gross PME findings this result was consistent with *Mycobacterium avium* subsp. *paratuberculosis* infection (Johne's disease) in this animal.

Figure 9: Thickened and corrugated small intestinal mucosa in a cow with Johne's disease

Respiratory system

Parasitic pneumonia (Husk)

Reports of lungworm infection in cattle are common in late summer and autumn (Figure 10). The development of immunity is dependent upon exposure, and therefore patent lungworm infections in adults can also occur. Unsurprisingly, cases of lungworm were detected across Great Britain during Q3 2023. In Scotland the percentage of diagnosable submissions where lungworm was diagnosed was at an all-time high (Figure 11). Twice as many cases are diagnosed in cattle over 12 months than in the post-weaned <12- month-old age category.

Husk was diagnosed on gross examination of a Simmental-cross yearling heifer submitted to SRUC Aberdeen. The animal originated from a suckler herd with 60 yearlings in a group, which were wormed and put onto pasture in May. Twelve of the animals in the group showed signs of pneumonia and were unresponsive to antimicrobial treatment. On postmortem examination, the lungs were heavy and non-collapsed and the tracheobronchial lymph nodes were markedly enlarged. Live worms were present in the airways (Figure 12) and there were patchy areas of consolidation of all the lung lobes (Figure 13). *Pasteurella multocida* DNA was detected in the lung by multiplex respiratory PCR and a secondary bacterial infection may have contributed to the lung pathology. In addition to the lung pathology, the mucosa of the abomasum appeared inflamed and prepatent and patent PGE was diagnosed by detection of 42,400 worms in abomasum (90% Ostertagia and 10% Trichostrongylus species) and 1350 strongyle eggs in the faeces, respectively.

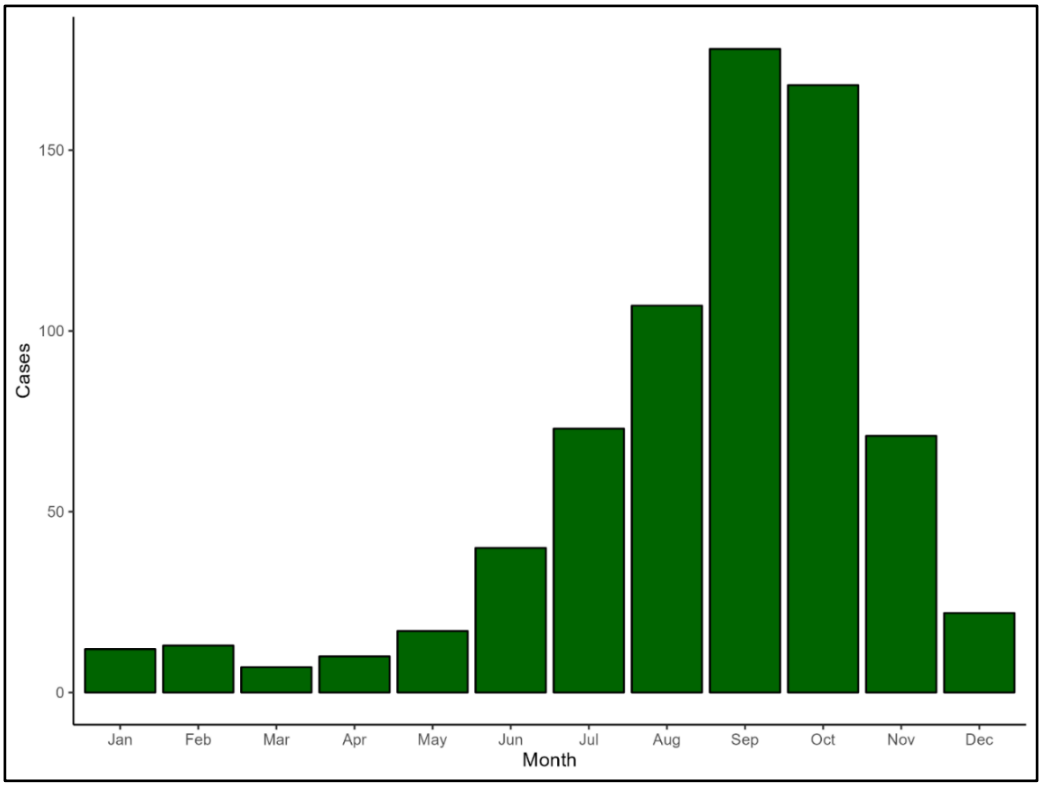

Figure 10: Diagnoses of parasitic pneumonia in cattle by month between 2002 and 2022 inclusive

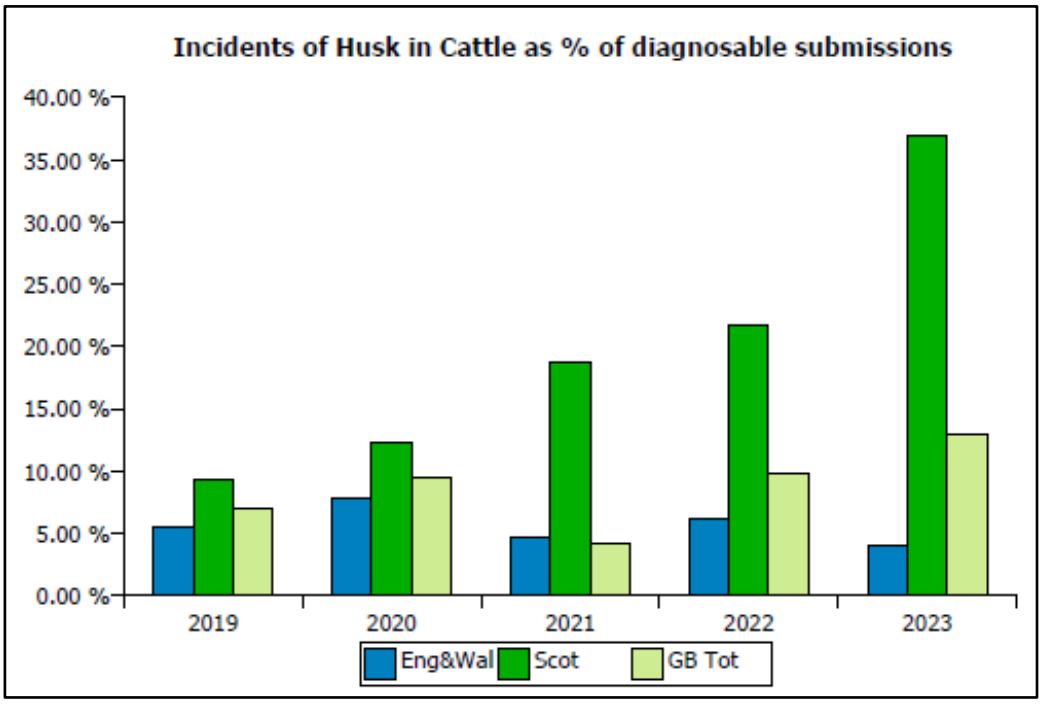

Figure 11: Incidents of husk in cattle in quarter 3 as a percentage of diagnosable submissions from 2019 to 2023

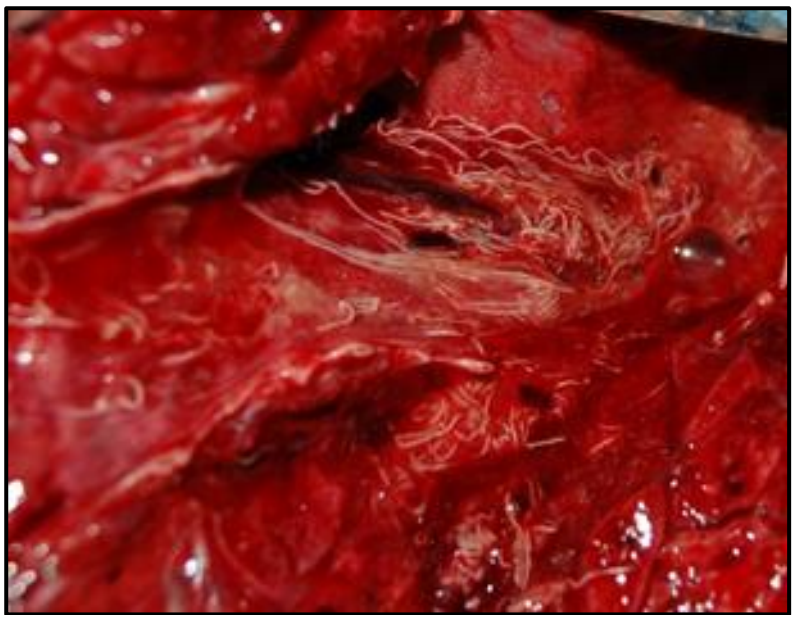

Figure 12: Lungworm in the trachea of a heifer with parasitic pneumonia (husk)

Figure 13: Patchy consolidation of the lungs of a heifer with parasitic pneumonia (husk)

Information on diagnosing and control of lungworm can be found at the COWS site: [lungworm-240823.pdf (cattleparasites.org.uk)]

Tracheitis due to coronavirus infection

Tracheitis due to bovine coronavirus infection (BCoV) was diagnosed by SRUC Perth in a 3-month-old Simmental cross heifer calf. A group of 24 calves had been out at pasture for 10 days but, had had access to the field from a shed for around 4-6 weeks before that. The first signs were noted around the time of this changeover. It started with a couple of calves showing respiratory signs, then spread more widely within the group. At examination, three calves showed upper respiratory noise, and crackles over the cranial lung lobes. Mucoid nasal discharge and a cough were noted. No pyrexia was reported.

One calf had died at the time of the veterinary visit, and froth in the trachea and larynx, which had a thick purulent appearance in the larynx, was seen. There was congestion of the lungs, particularly the cranial lobes, but no consolidation. *Pasteurella multocida* was cultured from the larynx and was detected in lung tissue by PCR. Histopathology found that the pulmonary lesions were mild and non-specific. In one section there was a mild to moderate suppurative bronchopneumonia but is not severe enough to cause death or significant disease. The trachea showed significant pathology, but changes were not consistent with an acute bacterial tracheitis. SRUC Vet Services (VS) noted that bovine coronavirus can replicate primarily in nasal and tracheal epithelium, and coronavirus was detected in lung tissue by PCR. Immunohistochemistry (IHC) for BCoV confirmed the presence of viral antigen in epithelial cells lining the trachea and in some detached cells also, but there was no labelling of epithelium in the lower airways of the lung section.

Musculoskeletal System

No significant trends this quarter.

Urinary System

No significant trends this quarter.

Nervous system and organs of special sense

Infectious Bovine Keratoconjunctivitis in dairy heifers

Plain and charcoal swabs, and swabs in Mycoplasma transport medium, were submitted to investigate the cause of Infectious Bovine Keratoconjunctivitis in a group of yearling replacement dairy heifers, ranging from 8-14 months of age. Approximately 30% of the group had cloudy corneas, with a central depression surrounded by a dark red rim of inflammation. There had been no response to various antibiotic treatments. *Mycoplasma bovoculi,* a recognised component of IBK, was detected in 2 of 6 calves. *Moraxella* spp. were not identified on culture and PCR testing for Chlamydia gave negative results. Cases have since only been treated with NSAIDs, and they seem to resolve over a period of 3 to 4 weeks, suggesting that immunity to the organism is required for resolution. The farm only reports issues in yearling animals which may fit with the waning of maternally derived immunity.

Two outbreaks of cerebrocortical necrosis (CCN)

A 4-month-old dairy crossbred calf was received to investigate the cause of sudden onset neurological signs, affecting 5 of a group of 77 calves, which exhibited convulsing, kicking at the abdomen, blindness, and recumbency. The calves had all been affected after moving from rough pasture to a fresh pasture, three days previously. They had been treated for coccidiosis using diclazuril and were vaccinated with a multivalent clostridial vaccine for ‘blackleg’ when moved. The group was being fed rearer-nuts until 10 to 14 days before the onset of clinical signs. Cows and calves had previously grazed the same

pasture with no problems arising, and there were no problems in other cows or groups of calves.

The calf was in lateral recumbency, with no menace response and muscle tremors prior to euthanasia. At PME, irregular areas of autofluorescence were seen on the cerebral hemispheres when viewed under ultraviolet light. There was also liquid to soft content in the large intestine, and a worm egg count confirmed 450 trichostrongyle eggs per gram. Lead poisoning was ruled out by biochemical testing of the kidney, and bacteriology excluded listerial encephalomyelitis. Histopathology confirmed severe subacute symmetrical necrotising encephalopathy, confirming cerebrocortical necrosis (CCN), with thiamine deficiency considered the likely cause. The change of pasture and the evidence of a significant parasitic alimentary worm burden, which is recognised as a potential risk for CCN, were considered significant factors causing this outbreak, although the exact reason for the onset of this disease is often uncertain. Restricted access to water is also thought to increase the risk for CCN. Outbreaks are more often seen in animals at pasture over the summer months than at other times of the year (Figure 14).

A second outbreak of CCN was also diagnosed in a group of 15-week-old dairy crossbred calves at pasture. The practitioner reported five animals affected in a herd of 140 cows. The calves were on a diet of concentrate and straw when indoors and moved to an old permanent pasture with no supplementary feed. Treatment with Vitamin B1 for some of the calves resulted in clinical recovery, with only one death at the time of submission of samples of brain for histopathology, which confirmed the characteristic lesions of CCN.

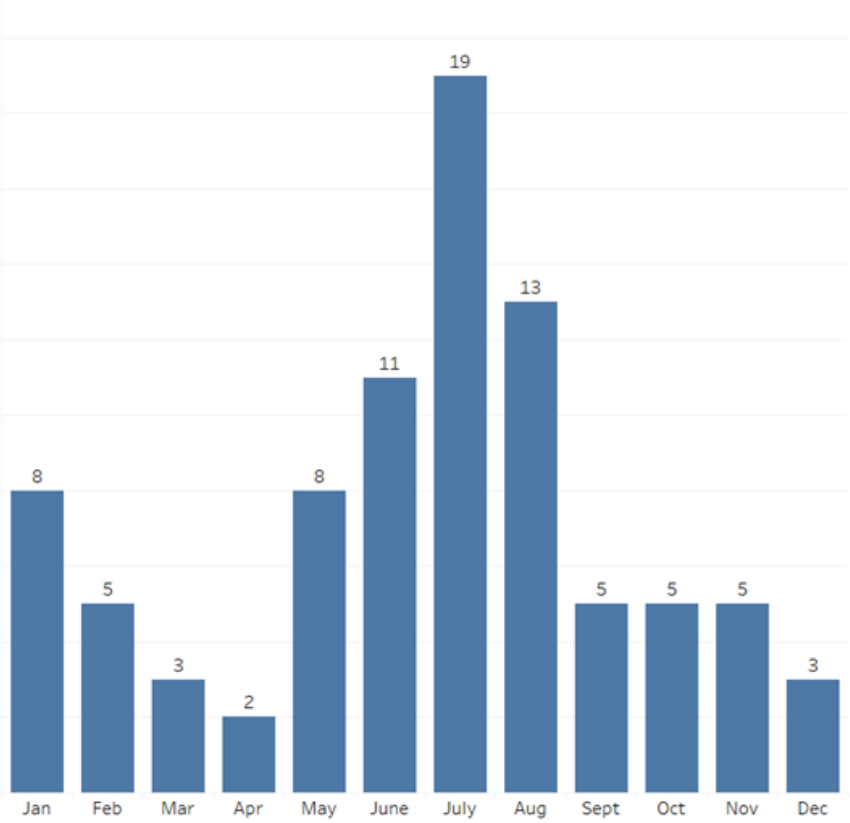

Figure 14: Seasonality of CCN in cattle in England and Wales 2012-2021

Skin disease

Dermatophilosis in calves

Skin lesions were reported in housed calves, affecting the ears, neck and back. These were not pruritic and consisted of larger scabby areas on pinnae, or multifocal raised hairs resembling ‘paint brushes’ in the neck and dorsal hair. No ectoparasites were detected microscopically, but histopathology on biopsy samples identified a chronic active pustular hyperkeratotic dermatitis with intralesional *Dermatophilus congolensis* bacteria. Dermatophilosis is sometimes referred to as ‘rain scald’ as it is considered to occur more often in animals which have been out in wet weather, but it can also affect housed animals as in this case. What triggers infection initially is uncertain; possibly localised trauma initiates infection followed by spread caused by grooming and rubbing.

Circulatory Disease

Histophilus somni myocarditis outbreaks

Two farms in the Shrewsbury catchment area had cattle diagnosed with myocarditis due to *Histophilus somni* in this quarter. At least six calves in a group of 370 calves, aged 4-5-months-old, were affected. They had developed sudden onset increased respiratory rate, followed by death within a short time despite antimicrobial treatment; or they had been found dead without premonitory signs. In each there was similar pathology with increased serous fluid within the pericardial sac, and different sized irregular foci of cream-coloured necrosis within the left ventricular myocardium. In the second case, two 16-month-old fattening bulls were affected, and one was submitted for postmortem examination.

Myocarditis is an unusual manifestation of *H. somni* infection, and the reason for this presentation is unclear. Outbreaks of similar disease in weaned animals have more commonly been identified by colleagues in Scotland, where pneumonia associated with *H. somni* has traditionally also been more prevalent. Vaccination is planned to try to enhance the animals’ resistance to infection.

Reproductive system – Abortion, Stillbirth, and Congenital Deformities

As discussed above (see Table 1), salmonellosis due to S. Dublin was the fourth most common VIDA diagnosis for this quarter. In addition to this, abortion due to S. Dublin was the most common cause of abortion and accounted for 31% of diagnosable abortion submissions this quarter.

Figure 15 shows the proportions of VIDA diagnoses by year for bovine abortions for 2018 to 2022. Unusually, for Q3 2023, abortion due to BVD/congenital BVD was the fourth most common cause of abortion and, accounted for 10% of the diagnoses. This diagnosis generally accounts for less than 5% of abortions (Figure 15).

Congenital BVD infection

Four blood samples were submitted from a suckler herd; they were from 6-week-old calves which had been ‘tag-tested’ three weeks previously and were confirmed to be BVD antigen positive, consistent with persistent infection. They were reported to show no clinical signs and their dams had tested negative for BVDv. It was reported that the neighbour’s bull had previously broken into the farm. One heifer was reported to have aborted, and one other calf was born with hind limb and ocular deformities.

BVD as a cause of abortions and small birth weight calves in a dairy herd

Six cows in an all-year-round calving herd of 210 dairy cows had aborted in late gestation; or produced stillborn or small birth-weight calves. The small birth-weight calves weighed approximately 20kg at birth but were alert and normal otherwise. The dams were all well with no other clinical signs. The farm was considered BVD free, but cattle were occasionally bought in. An aborted fetus and blood samples from two of the small birth weight calves were submitted.

PCR testing of foetal spleen was positive in both calves for BVD Type 1, confirming foetal infection with BVD as the likely cause of fetopathy. No other pathogens were found during testing. This may have indicated either that these calves were persistently infected (PI) or, may have been the result of a transient infection. Further investigation into BVD at a herd level was recommended, as well as testing of the dams to investigate if they could have been PIs.

In another submission, a recently purchased pedigree shorthorn heifer had aborted whilst in quarantine with two other heifers. She did not show any other signs of ill health. The foetus and placenta both had gelatinous oedema. BVDV was detected in the foetal spleen and the dam was serologically positive for BVD. No other abortifacients were detected confirming abortion due to BVD type 1.

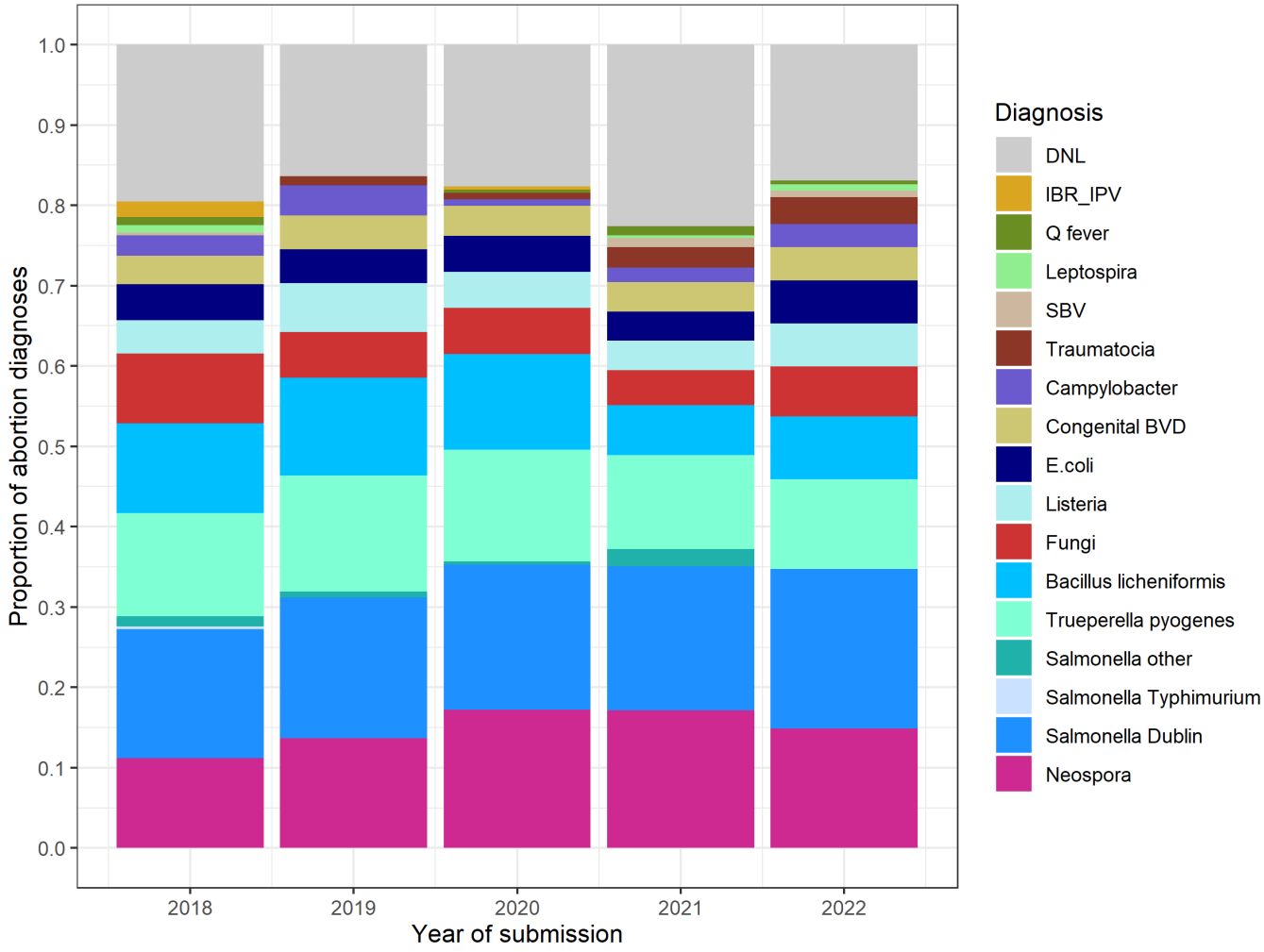

Figure 15: Bovine abortion diagnoses by year for 2018-2022 (from foetus submissions only)

Abortion due to Campylobacter fetus venerealis intermedius

A second trimester foetus was submitted to investigate sporadic abortions in a large dairy herd. The cow was clinically healthy. Grossly, the foetal liver was found to be enlarged and covered by a mat of fibrin. There was an extensive fibrinous pleurisy and pericarditis. *Campylobacter fetus venerealis intermedius* was isolated from the foetal stomach contents. There had been previous reports of *Campylobacter spp.* abortion and fertility issues, including endometritis, in this herd.

Abortion due to parainfluenza virus 3 (PI3)

Abortion due to PI3 was diagnosed by SRUC Dumfries in a Jersey heifer, in a new dairy farm stocked with in-calf heifers that had been imported from Denmark over the previous few months. A multiplex PCR test used to screen the liver for bovine herpesvirus 1 (IBR), returned a positive result for bovine parainfluenza 3 virus. Histopathology revealed a multifocal subacute to chronic pneumonia with changes suggesting ongoing repair following an episode of necrosis and inflammation. There was no evidence of a necrotising alveolitis/bronchiolitis typical of active PI3 infection. Immunohistochemistry carried out on

lung demonstrated positive labelling for PI3 within phagocytic cells in the terminal airways. The findings confirmed foetal PI3 infection and indicated that it was in the reparative phase at the time of abortion. PI3 is not commonly diagnosed as a cause of bovine abortion but has been previously reported. It was not possible to confirm whether this was a one-off case and there were no ongoing losses.

Fetal parainfluenza virus infection causing abortion in dairy heifers - 2023 - Veterinary Record - Wiley Online Library

Suspect genetodermatosis / ectodermal dysplasia in an imported Fleckvieh calf

A group of imported Fleckvieh heifers were introduced to a 190 suckler cow herd and formed part of a 28-animal group, which were at grass at the time of the submission. This was the second abortion in the group. Gestation was estimated at 212 days, and marked alopecia sparing the peripheral skin was noted on gross examination (Figure 16). Gross and histopathological examination of the thyroid was unremarkable and fungal culture was negative. Histopathological examination of the tissue was suggestive of ectodermal dysplasia. There are no reports of this condition leading to abortion, however a novel genetic defect which incorporates an ectodermal dysplasia and affects foetal viability could not be excluded.

Figure 16: Alopecia in an aborted Fleckvieh foetus with ectodermal dysplasia

Mastitis

There were no significant trends for this quarter.

Mastitis due to *Klebsiella oxytoca*, with resultant endotoxaemia, was identified as the cause of death in two recently dried-off dairy cows. Both cows deteriorated approximately three days following administration of intramammary treatments, presenting initially in sternal recumbency, and exhibiting bruxism, and later proceeding to lateral recumbency. Bacteriology identified a heavy, pure growth of *Klebsiella oxytoca* from the mammary gland of one cow, and a mixed flora containing a heavy growth of *Klebsiella* oxytoca and a few colonies growth of non-haemolytic coliform from the other. A review of protocol, hygiene, and technique at drying off, as well as management of cows immediately

following dry-off, was recommended to minimise further losses. Interestingly, both cases of mastitis affected the right hind quarters and ensuring there was no risk for contamination of the right hind teat end, whilst reaching forward to access the front quarters, was identified as an important area of focus.

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. For more details, please see the COEEML pages on the Vet Gateway.

Antimicrobial use and resistance

The Veterinary Antibiotic Resistance Sales and Surveillance (UK-VARRS) Report 2022 has been published by the Veterinary Medicines Directorate (VMD): Veterinary Antimicrobial Resistance and Sales Surveillance 2022 - GOV.UK (www.gov.uk)

This latest UK-VARSS report continues to document downward trends in sales of veterinary antibiotics in the UK. In addition, the latest RUMA Targets Task Force report can be found at: RUMA-TTF-Report-2023-FINAL.pdf

The Medicine Hub, a voluntary industry initiative, developed and managed by AHDB, was launched in 2021 and provides a central location for the collection of medicine data, including antibiotic use: Medicine Hub for dairy, beef and sheep farmers | AHDB

Chemical food safety

The latest Chemical Food Safety Reports can be found at: APHA chemical food safety reports (livestock) - GOV.UK (www.gov.uk)

Toxic conditions

Hemlock Water Dropwort toxicity and PGE in dairy heifers

Two 10-month-old dairy heifers were submitted to investigate the death of four from a group of 80 in 24 hours. In addition, 70% of the group had been losing condition over the previous week, and 40% had started scouring. The group had been moved into the field where the deaths occurred less than seven days previously, and the calves were beginning to scour prior to moving. There was poaching of a brook in the field and a large amount of a purple plant thought to be Himalayan balsam (which is not poisonous to

livestock) was found growing near the brook. Samples of the plant material were submitted with the calves. The heifers had last been treated with ivermectin approximately six weeks previously.

A pooled faeces sample from this group was submitted on the same day as the calves and a high worm egg count of 1100 eggs per gram of trichostrongyle-type eggs was detected. Significant findings at PME included liquid faeces, abomasal mucosa thickened with a roughened/nodular appearance, enlarged mesenteric lymph nodes, and abnormal plant material in the rumen of both calves. There were large numbers of long thick fragments of fibrous stems approximately 0.5cm wide in the rumen of both calves, and white tubers approximately 10cm long along with large numbers of white fleshy fragments in the rumen of Calf 2. The submitted plant material and corresponding material in rumen of both calves was highly suspicious of Hemlock Water Dropwort (*Oenanthe crocata*) (Figure 17).

Figure 17: The roots of the Hemlock Water Dropwort plant (kindly supplied by the private veterinary surgeon)

Hemlock Water Dropwort grows in ditches and can cause sudden death, nervous signs, and diarrhoea at sublethal doses. The toxin oenanthotoxin, is fast-acting, with clinical signs developing within minutes of ingestion.

Suspected oak poisoning

A case of suspected oak (*Quercus* spp.) toxicity was seen in a two-year-old Limousin heifer which was found dead in the field with no prior clinical signs. Recently a large limb had fallen from an oak tree into the field where the animal was found. At necropsy, rumen fill was reduced, and contained numerous brown (dead) oak leaves and a small number of green (fresh) oak leaves. A single oak bud was also found. No acorns or acorn fragments were seen. Additionally there were a small number of other leaves a couple of which could

have been consistent with *Pieris* spp. Large intestinal content was dry and firm, and urine was pink to red and opaque. The subcutaneous tissues of the ventral neck were expanded by moderate amounts of yellow to red gelatinous oedema, while other subcutaneous tissues were tacky. The carcase was in an advanced state of autolysis meaning histology of the kidneys was not possible but vitreous humour urea value of 39.6mmol/l was considered consistent with significant renal disease.

SRUC VS commented that in light of the history of possible consumption of oak leaves and/ or immature acorns, the finding of partially digested parts of oak in the rumen was significant, although it should be noted that parts of immature acorns were not found.

Horizon scanning

International Disease Monitoring (IDM) horizon-scanning activities monitor for major, notifiable, or new and re-emerging animal disease outbreaks worldwide. This is done to provide an early warning and to assess the risks they may pose to the United Kingdom (UK), particularly for those diseases which impact on animal health and welfare, international trade, public health, or wider society. IDM also assess the risk that animal diseases might come into the UK through the trade in aimals or animal products (legal or illegal), through movements of wildlife, or through the movement of fomites and vectors such as insects which may carry infectious disease. These outbreak assessments are used to guide decisions how to manage or reduce the risks and are published on the web: Animal diseases: international and UK monitoring - GOV.UK (www.gov.uk)

Bluetongue virus in Europe: updated outbreak assessment and maps from England and Europe can be found at: 29 November 2023: updated outbreak assessment for Bluetongue virus in Europe - GOV.UK (www.gov.uk)

Epizootic Haemorrhagic Disease (EHD): following initial confirmation of EHD in France on 21st September, 1,194 outbreaks have been recorded on farms in southern France.

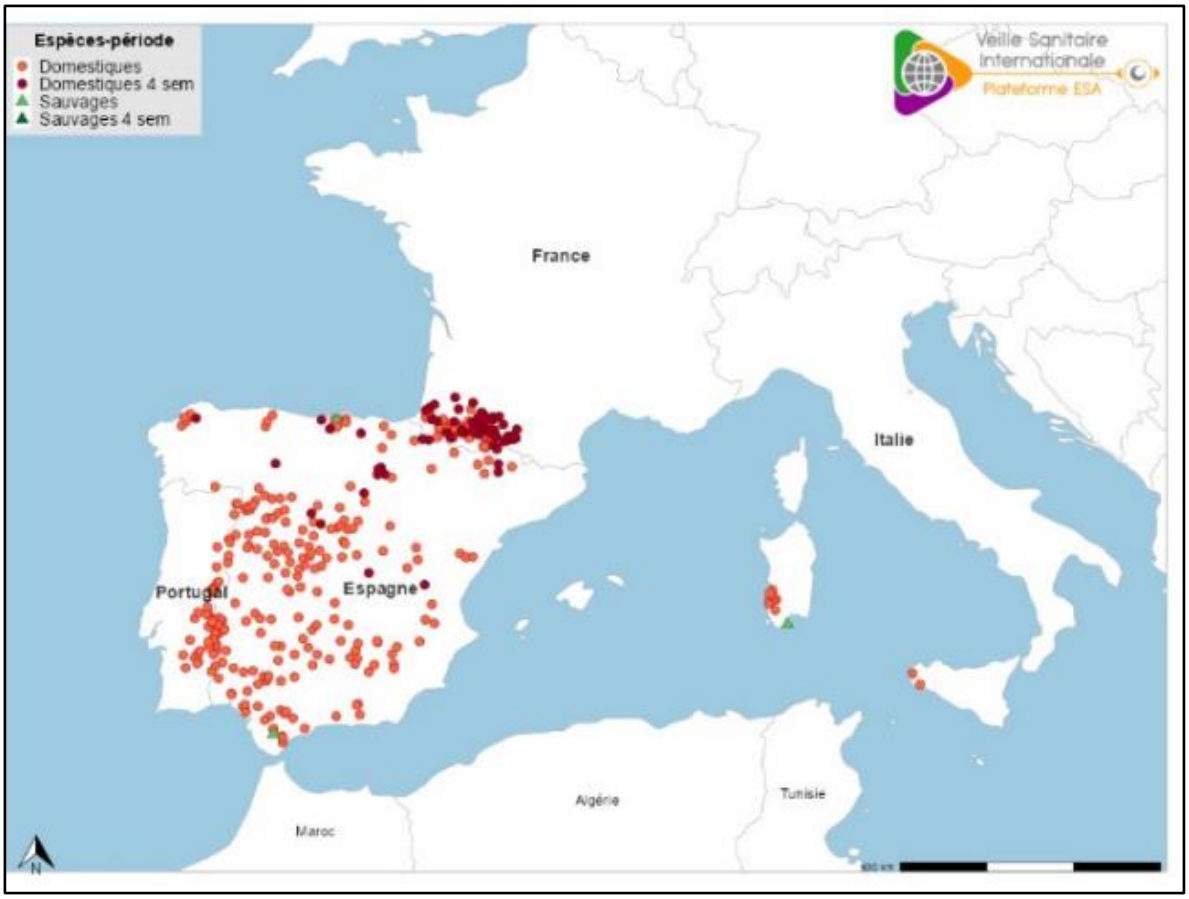

Figure 18: Map showing historic EHD outbreaks detected since 25 October 2022 (orange dots) and outbreaks that have occurred between 26 September and 24 October 2023 (red dots) in Europe, reported by the EU Animal Diseases Information System (ADIS).

Foot and Mouth Disease (FMD): Nothing to report in November.

Lumpy Skin Disease (LSD): In November, there were reports of LSD in Russia (5), South Korea (55), Thailand (3) and Libya (3) (WOAH data only).

Publications of interest

APHA (2023) Disease surveillance in England and Wales, September 2023. Veterinary Record: Disease surveillance in England and Wales, September 2023 (wiley.com)

OTTER A; SCHOCK A; PAYNE J (2023) A form of hepatogenous copper poisoning in fattening cattle associated with the ingestion of mouldy straw. Vet Record Case Reports 11 (2) 2592. A form of hepatogenous copper poisoning in fattening cattle associated with the ingestion of mouldy straw - Otter - 2023 - Veterinary Record Case Reports - Wiley Online Library

JEWELL N; SWINSON V; HAYMAN C; MARTINDALE L; BRZOZOWSKA A; Mitchell S (2023) Laboratory diagnosis of gastrointestinal nematodes in first-grazing season cattle. Veterinary Record 192 (9) 364-36 Laboratory diagnosis of gastrointestinal nematodes in first-grazing-season cattle - Jewell - 2023 - Veterinary Record - Wiley Online Library

Monthly APHA disease surveillance reports can be found at this link: APHA disease surveillance monthly reports - GOV.UK (www.gov.uk)

APHA focus articles in the Veterinary Record can be found at: APHA focus articles in the Veterinary Record - GOV.UK (www.gov.uk)

APHA Surveillance Focus Article, August 2022. *Veterinary Record*
Managing liver fluke on hill farms (wiley.com)

OTTER A; BRZOZOWSKA A (2022) Pneumonia in adult cattle, *Veterinary Record 5/12 March 2022 191-193* Pneumonia in adult cattle (wiley.com)

The 2022 edition of the *Salmonella* in animals and feed in Great Britain (previously called *Salmonella* in Livestock Production in GB) has been published and is now available here: Salmonella in animals and feed in Great Britain - GOV.UK (www.gov.uk)

Statement regarding use of this material

This publication is available at:

https://www.gov.uk/government/collections/animal-disease-surveillance-reports

Any enquiries regarding this publication should be sent to us at SIU@apha.gov.uk

http://apha.defra.gov.uk/vet-gateway/surveillance/index.htm

The Animal and Plant Health Agency (APHA) is an executive agency of the Department for Environment, Food & Rural Affairs, and also works on behalf of the Scottish Government and Welsh Government.