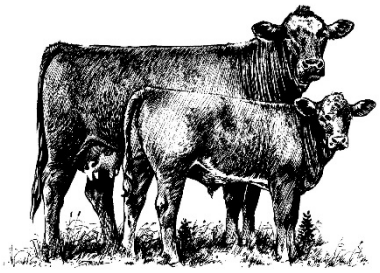
Animal & Plant Health Agency



SRUC

GB cattle quarterly report

Disease surveillance and emerging threats

Volume 27: Quarter 2 (April to June) 2023

Highlights

- **Ruminant vaccine supply issues – page 3**
- **Abomasal lesions in dairy calves – page 7**
- ***Toxocara vitulorum* infection in a suckler herd – page 10**
- **Lungworm 'Husk' in a five-year-old bull in May – page 12**

Contents

Editor: Vanessa Swinson, APHA Thirsk
Phone: + 44 (0) 208 5654574
Email: Vanessa.swinson@apha.gov.uk

Introduction and overview

This quarterly report reviews disease trends and disease threats for the second quarter of 2023 (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

Dairy update

- **Prices:** UK farmgate milk prices averaged 36.48ppl in June, which was down 7.1ppl (-16%) from where they ended the last quarter in March. Cuts to milk prices have continued throughout Q2, with price gains made in the latter half of 2022 now outweighed by these price cuts. Although has been some easing on the inflationary pressure on some inputs such as energy, feed and fuel, farm input costs remain historically high.
- **Production:** GB milk production peaked in May meaning that the seasonal spring flush has now passed. We estimate that 3,284 million litres of milk were produced in the 3 months April - June, in line with volumes seen for the same period last year.
- **Trade:** Year-to-date (Jan-May) volumes of dairy exports from the UK totalled 547Kt, a 4% decline compared to the same period in 2022. Despite this, the value of these exports has increased by 15% to £822million, driven by inflation.
- **Demand:** For the 12 weeks ending 17 June 2023, Cow's milk value was up 21.5% while volumes sold in retail declined by 3.6% to 940,308,595 litres. *Source: NIQ Scantrack | Total GB | Cow's Milk | 12we 17/06/23 vs YA*

Beef update

- **Prices:** GB deadweight prime cattle prices began the quarter strong, with the all-prime measure averaging 488p/kg in the week ending 1 April. However, prices have been falling since the end of May, averaging 466p/kg in the week ending 22 July. Cow prices have seen similar movement, with the GB overall average measure losing nearly 33p from the start of the quarter.
- **Production:** Beef production in the UK totalled 75,100 tonnes in June, a 3% increase on the same month last year. Beef production for Q2 fell by 3% YOY, totalling 222,200 tonnes. This comes as both prime cattle kill, and cull cow kill, for the YTD (Jan-Jun) saw YOY increases of 0.9% and 2% respectively (Defra).

- **Trade:** UK exports of fresh and frozen beef totalled 8,600 tonnes in May, increasing 11% on April's levels but down 26% YOY. This YOY decline was driven by a fall in exports to the EU, especially to France, the Netherlands and Germany. Total volumes exported to the EU fell 23% YOY but, has grown market share to 92%. For imports, gains were recorded both month-on-month (MOM) and YOY, up by 21% and 3% respectively. Increased shipments from Ireland was the key driver of this, potentially a reflection of recent beef price movements.
- **Demand:** In the 12 weeks ending 09 July 2023, average consumer spend on beef rose by 10% YOY whilst volumes fell by 2.5%. As has been well-documented, inflation is causing price rises across many products, with the average price paid over the same period rising by 13% YOY. All cuts of primary beef aside from steaks were in volume decline, with roasting joints seeing the biggest decline, down 13.3%. Processed beef declined by 4.0%, while mince volumes were down 2.4% YOY.

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 second quarter (Q2) of 2023, compared to Q2 in 2022, and Q2 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 Q2 of2023, Q2 of 2022, and Q2 for 2015-2023

10 most frequent carcase diagnoses Q2 2023	10 most frequent carcase diagnoses Q2 2022	10 most frequent carcase diagnoses Q1 2015 to 2023
1. Pneumonia due to *Pasteurella multocida*	1. Pneumonia due to *Mycoplasma bovis*	1. Navel ill / joint ill
2. Pneumonia due to *Mannheimia haemolytica*	2. Cryptosporidiosis	2. Hypogammaglobulinaemia
3. Digestive disease due to other causes (not listed)*	3. Hypogammaglobulinaemia	3. Cryptosporidiosis
4. Abomasal ulceration	4. Coccidiosis	4. Digestive disease due to other causes (not listed)
5. Navel ill or joint ill	5. Rotaviral enteritis	5. Respiratory disease due to other causes (not listed)

10 most frequent carcase diagnoses Q2 2023	10 most frequent carcase diagnoses Q2 2022	10 most frequent carcase diagnoses Q1 2015 to 2023
6. Colisepticaemia	6. Respiratory disease due to other causes (not listed)	6. Pneumonia due to *Mannheimia haemolytica*
7. Congenital abnormality	7. Digestive disease due to other causes not listed	7. Colisepticaemia
8 Pneumonia due to *Mycoplasma bovis*.	8. Navel ill / joint ill	8. Pneumonia due to *Pasteurella multocida*
9. Respiratory disease due to other causes (not listed)**	9. Systemic disease due to other causes (not listed)	9. Pneumonia due to *Mycoplasma bovis*
10.Coccidiosis	10. Pneumonia due to *Pasteurella multocida*	10. Rotaviral enteritis

For Q2 2023, the digestive disease diagnoses not listed (*) elsewhere included mycotic rumenitis, ruminal impaction, abomasal volvulus, ileal intussusception, dental abnormalities, and gastroparesis syndrome. For Q2 2023, the respiratory disease diagnoses not listed (**) included traumatic laryngitis and pulmonary emphysema.

New and re-emerging diseases and threats

Vaccine supply issues

There have been ongoing issues with shortages of sheep vaccines (issues for around 24 months, with the specifics varying from month to month), and for several months for cattle clostridial vaccines. APHA has also been made aware of recent issues with pharmaceutical companies obtaining vaccines for bovine leptospirosis in the UK. Two leptospirosis vaccines are licensed - one is unavailable in the UK, and the other is in very short supply. Some private veterinary practitioners have also reported difficulty in obtaining lungworm vaccine. Vaccine supply issues have been discussed at stakeholder meetings during July and August.

At a recent meeting, the potential reasons for the supply problems were discussed. These include delays in manufacture due to human vaccines being prioritised in plants which make both human and animal vaccines; issues around batch release to the UK from other countries; issues of vaccine batch failure; and issues related to importation.

There may also be increased demand for livestock vaccines, as part of the effort to minimise antimicrobial use, supply chain and certification scheme requirements, and with farmers following veterinary advice on herd and flock health planning.

The problems arising from vaccine supply issues range from disease outbreaks with limited ability to prevent further cases (private vets have reported difficulties in dealing with outbreaks of blackleg, abortion and orf), disruption to vaccine courses and programmes, impact on farmer and vet practice incomes, stress, damaging of relationships between the vet and their clients, and the costs of stockpiling vaccines (private vets report buying-in extra stock when it is available, and risking over-buying). There are also potential One Health impacts if zoonotic diseases increase, such as toxoplasmosis, orf, and leptospirosis. Vaccine shortages may also impair the effectiveness of the Defra-funded, Animal Health and Welfare Pathway vet review flock/herd health planning visits, as the use of vaccines may be one strand of the recommendations from the visit. APHA is liaising with stakeholders and industry bodies on this issue and will monitor trends in the relevant diseases in ruminants. It was raised at the APHA Veterinary Risk Group in August.

Acute *Staphylococcus aureus* mastitis following drying-off

Over the last few years, we have reported several cases of acute mastitis following drying off. Whilst strict hygiene and good drying-off protocols are always important, it is of even greater importance when using teat sealant without antibiotics. A dairy cow was submitted for postmortem examination, being the third to have died following drying off in a herd of 230 cows. Two of the cows had received antibiotic and teat sealant, the cow submitted had only the teat sealant. Ecchymoses were present subcutaneously throughout the carcase. The left hind quarter was enlarged and there was much subcutaneous oedema over the entire mammary gland. Within the affected quarter there was watery amber-colour liquid and cream-coloured clots. The sealant was located within the udder tissue, and none was in any of the teat canals. The findings were consistent with acute mastitis and *Staphylococcus aureus* was isolated in pure culture. Histopathology confirmed a severe multifocal acute fibrinosuppurative mastitis. The findings suggested that the infection was likely to have been precipitated by both incorrect application of the teat sealant, and poor hygiene measures at drying-off.

Changes in disease patterns and unusual diagnoses

Systemic disease

Gangrene due to *Salmonella* Dublin infection

Penrith Veterinary Investigation Centre received a 5-week-old calf from a dairy farm rearing unit with a total of 420 cattle, including 210 adults. Calves were moved to the rearing unit at approximately four-weeks-old. A few young calves had recently been noticed with non-specific malaise, diarrhoea, coughing, or joint stiffness. One of the calves with affected limbs was euthanased after developing swelling, then rupture, of one of its hind leg fetlock joints, and it was submitted for postmortem examination.

It had hairless necrotic dry skin over the fetlock joints of both hind legs. The joint capsule of one of the fetlock joints had disintegrated, there was necrotic material at the site, and exposure of the metatarsal bone which had eroded synovial cartilage (Figure 1). The lungs had multifocal consolidation and a pleural abscess. *Salmonella* Dublin was isolated from the lung and abscess, though not the faeces or affected joints. Infection by *S*. Dublin was previously diagnosed on the home farm in 2014, when there was an abortion storm and diarrhoea outbreak, though there had been no clinical signs of salmonellosis in the intervening years.

Gangrene of the extremities is an unusual manifestation of *S*. Dublin infection. In addition to the limbs, as in this case, it can also affect the tail or ears. *S*. Dublin infection can be maintained without clinical disease for extended periods as is suggested in this herd, although cattle have been purchased since the 2014 outbreak. The bacteria can be introduced to naïve herds through the purchase of carrier animals, or contact with cattle faeces; movement of sheep, and sharing vehicles or equipment are also risk factors. Controlling disease relies on improving hygiene, especially in the calving environment, and isolating affected animals, however the extent of infection, and hence shedding of the bacteria, is unpredictable. A commercial vaccine is also available and can be employed as part of a disease control plan.

Details of any salmonellosis incidents must be reported under the Zoonoses Order 1989; a risk assessment is undertaken, and the medical authorities informed. Although human infection by *S*. Dublin is rare, it has the potential to be life-threatening, and it is essential that those working with animals practice the highest standards of personal hygiene.

A review *Salmonella* Dublin infection was published by Henderson and Mason (2017).

Reference

Henderson K, Mason C. Diagnosis and control of *Salmonella* Dublin in dairy herds. *In Practice* 2017;39:158-168

Figure 1: Gangrenous lesions (with clear demarcation of viable tissue) in a calf with salmonellosis due to Salmonella Dublin

Salmonella Mbandaka isolation from a cow with toxic mastitis and diarrhoea

An adult dairy cow was submitted after dying one week post-drying off. On postmortem examination there was swelling of the back left quarter of the udder and the mammary tissue was dark red in colour. Haemorrhages were present throughout the carcase, indicative of a septicaemia or toxaemia as the cause of death. The gross pathology was also suggestive of enteric disease. Toxic mastitis affecting the back left quarter of the udder was confirmed on bacteriology, with the identification of a haemolytic E. coli. In addition, *Salmonella* Mbandaka was isolated from caecal content. *S*. Mbandaka is the second most common salmonella serovar isolated from cattle after *Salmonella* Dublin. The typical clinical presentation is adult cattle with diarrhoea, but the organism can also be isolated from the faeces of clinically normal animals. Initial introduction onto farm may be associated with feed contamination, but the organism can sometimes become resident on dairy farms in carrier animals and, is spread via movements of animals and by fomites. *Salmonella* Mbandaka is potentially zoonotic, and health and safety advice was issued.

Digestive system disease

Dosing gun injury in pregnant dairy heifers

An in-calf heifer from a group of 123 replacement heifers, in a 460-cow autumn block calving dairy herd, was presented for postmortem examination. It was described as having had peracute onset of open-mouthed breathing followed by death, having been observed unaffected the previous day. It was the second to die in the last 10 days with similar signs.

The heifers were at pasture. Gross pathology included extensive haemorrhages, foul-smelling necrotic tissue around the larynx, trachea, and oesophagus, and foul-smelling, dark necropurulent and fibrinous pleural fluid. The lesions were consistent with a ‘dosing gun injury’. The animals had been given boluses five months previously, suggesting that this was when the original insult occurred. The use of dosing guns always carries the risk of trauma, especially if animals are boisterous, there are unskilled operators, or if the wrong equipment is used; and a review of these aspects was recommended.

Abomasal lesions in dairy calves

Over the last two to three years, we have reported several times on abomasal disease in dairy calves. Three such cases from this quarter are described below.

Four unexplained acute deaths were reported in unweaned dairy calves. This coincided with a period of cold weather. The calves were seen drinking their milk normally yet were found dead within 12 hours. The calves were on a rearing premises, having been moved from the dairy herd after registration, and when the navels had dried. The fourth calf to die, aged approximately one month, was presented for examination. It was sunken-eyed, pale and had subcutaneous oedema over the ventral abdomen. Gastrointestinal contents, with fibrin clots, were free in the abdominal cavity and covering the viscera. The rumen was well-filled with short fibre and soft contents. A 4mm diameter, full thickness perforated ulcer was present in the fundus of the abomasum, with several smaller ulcers surrounding this larger lesion. No *Salmonellae* or coccidia were identified in the large intestine contents. The examination confirmed that death was caused by peritonitis, a consequence of the abomasal perforation.

The carcase of a one-week-old dairy cross calf was received after being found dead. Postmortem examination identified an abomasal rupture with secondary peritonitis. The appearance of the abomasal mucosa was suggestive of a primary abomasitis as the initiating cause, and this was confirmed on histopathology. *Cryptosporidium* spp oocysts were also detected in caecal content.

Abomasitis, abomasal rupture, and peritonitis were also the cause of death in a two-week-old dairy calf which appeared bloated before death. Again, histopathology was used to confirm the diagnosis. On this farm only heifer calves were affected. This group were fed artificial milk, as opposed to the unaffected bull calves which received whole milk.

Predisposing factors for abomasitis development include irregular feeding, bacterial contamination of milk/poor hygiene, variable feeding temperature, inadequate mixing of the milk powder, and inconsistent weighing of the milk powder. A review of the calf milk feeding routine on these farms was recommended.

Idiopathic necrotising enteritis of suckler calves (INE)

A two-month-old Stabiliser-cross suckler calf was submitted after displaying lethargy, a mild cough, pyrexia, anorexia, the only one affected in the group of 75. There were interesting gross findings consisting of sloughing of rumen and reticulum mucosa; and

ulceration/erosion of the abomasum, jejunum, and ileum, with overlying diphtheritic plaques. The left kidney was enlarged with a pale cortex, and cerebellar coning was also present. Bacterial infections (including enteric listeriosis), BVD, and Malignant Catarrhal Fever (MCF) were ruled out via testing. Histopathology of intestine and kidney confirmed a diagnosis of idiopathic necrotising enteritis. This condition, affecting two to three-month-old suckler calves at grass, is poorly understood and the cause is currently unknown, however mortality rates are usually very high at over 95%.

References:

Colin Penny: Penny CD, Scott PR, Watt NJ, Greig A. Necrotic enteritis of unknown aetiology in young beef calves at pasture. *Vet Rec* 1994; 134: 296–9.

Suckler calf diseases - Otter - 2021 - Veterinary Record - Wiley Online Library

Johne's disease in a 10-month-old heifer

The carcass of a 10-month-old dairy heifer was submitted for investigation of intermittent scour and wasting. Gross postmortem examination showed the animal to be anorexic and dehydrated, with pale kidneys and intra-cranial haemorrhages. Laboratory testing demonstrated uraemia and selenium deficiency. Histopathological examination of tissues detected a chronic, granulomatous enteritis caused by Johne's disease along with renal injury. Both the renal pathology (with resulting uraemia) and the hyposelenosis were likely to be complications of the Johne's disease. The farm was reported to have a high incidence of Johne's disease. The young age of this animal at the onset of clinical signs suggested a high level of environmental contamination with *Mycobacterium avium paratuberculosis* (MAP); and/or poor management of calves to prevent exposure to faeces, colostrum and milk from cows that were shedding MAP. The introduction of measures to prevent exposure of calves to MAP was recommended as a matter of urgency.

Unusual diarrhoea in Wagyu-cross suckler calves

A high morbidity, low mortality, outbreak of unusual white diarrhoea in Wagyu-cross sucker calves was investigated by SRUC Aberdeen. No consistent pathological agent(s) were identified despite extensive testing, although some calves developed classic coccidiosis as a secondary event. There is anecdotal evidence from Australia, and limited experience within SRUC, that the Wagyu breed appears to be particularly susceptible to dysbiosis, especially following antibiotic use. Both the metaphylactic use of antibiotics in newborn calves, and high penicillic acid levels in the silage, were considered plausible predisposing factors for the calves to develop a dysbiosis in early life. Investigation and monitoring of scours in the herd is ongoing.

Parasitic gastroenteritis (PGE) diagnoses during May 2023

Parasitic gastroenteritis (PGE) was diagnosed in Veterinary Investigation Centres (VICs) in England and Wales during May and June. Four of a group of 100 dairy heifers aged seven months died, and the carcase of the fourth was submitted for postmortem examination to Starcross VIC. The heifers were in a herd of around 1000 cattle and, had been on a three-day rotational grazing system since turnout six weeks previously in early April. Loss of condition and diarrhoea affecting around 90% of the group had been noticed in the week before the submission. There was green liquid content in abomasum which had dark purple mucosa with nodular thickening (Figure 2). Intestinal content was also of watery consistency. Parasitological examinations revealed a significantly high total worm estimate of 58,500 *Ostertagia ostertagi* in the abomasum, and a worm egg count in liquid faeces of 2,450 eggs per gram, confirming ostertagiosis. Immediate anthelmintic treatment of the remaining animals was recommended, and in such cases the provision of supplementary concentrate is worth considering, to aid recovery from the damaging effects of the parasites.

Figure 2: Nodular thickening of the abomasal mucosa in a calf with ostertagiosis

Other PGE cases during May included the submission of faeces samples from 6-month-old calves, which had a trichostrongyle worm egg count of 450 epg in soft consistency faeces, confirming an adult nematode burden. In another submission, an 8-month-old calf, submitted to investigate chronic ill-thrift and mortality in a group of dairy-cross calves, had a worm egg count of 900 trichostrongyle-type eggs per gram, indicating a heavy infestation with gastrointestinal worms. *Nematodirus battus* eggs (50 per gram) were also detected in addition to trichostrongyle-type eggs. It is likely that parasitic gastroenteritis (PGE) contributed to the ill-thrift in this animal. A coccidial oocyst count of 1350 was detected, with 87% being of pathogenic species (*E. bovis* and *E. zuerni)*. Although this calf was older

than the age normally affected by coccidiosis, coccidiosis may have also contributed to ill-thrift.

These cases were noteworthy for how early they occurred in the grazing season. This year's dry hot spring probably reduced exposure to the parasites on pasture, delaying the development of immunity. PGE should be considered for any grazing animals failing to thrive, and especially if diarrhoeic. In cattle, faecal worm egg counts are not reliable for identifying significant parasite burdens and may be very low despite PGE being present. Further advice on parasitic diseases and their control is available at https://www.cattleparasites.org.uk/ and https://bvajournals.onlinelibrary.wiley.com/doi/epdf/10.1002/vetr.3020

APHA is interested in further investigation of these bovine parasitic diseases. During the 2023 grazing season, work with the Moredun Research Institute (MRI) aims to determine both the species composition of gastrointestinal nematodes, and the frequency of genes that confer benzimidazole (BZ) resistance in these populations. This information will be used to raise awareness of the risk of anthelmintic resistance among cattle farmers and their advisers and, inform national best practice guidelines. Faeces samples from 10 first grazing season cattle can be submitted for a free of charge composite faecal egg count. Anonymised deep-amplicon sequencing will also be done at MRI for speciation, and to detect genetic markers of BZ resistance. Details are available at http://apha.defra.gov.uk/vet-gateway/surveillance/seg/cattle.htm

Toxocara vitulorum infection in a suckler herd

Toxocara vitulorum infection was identified at Thirsk Veterinary Investigation Centre (VIC) in a suckler herd. The presence of adult worms was confirmed in the faeces of a one-month-old calf, which also had a worm egg count of 3,500 *Toxocara* species eggs per gram (Figure 3). The affected calf had been dull and not thriving, and was with its dam in a group of adults and calves at pasture, having been turned out one week previously.

Toxocarosis is an uncommon cause of parasitic gastroenteritis in cattle in Great Britain, this diagnosis having been recorded only three times in the last 10 years (VIDA 2023). Each of the diagnoses was in suckler herds. A previous report on an infected suckler herd in south Wales, which was identified at Carmarthen VIC, described calves with diarrhoea and "lack lustre" coats (Jones and others 2009). *T. vitulorum* infection has also been described in water buffalo (*Bubalus bubalis*), zebu (*Bos indicus*), lowland anoa (*Bubalus depressicornis*), European bison (*Bison bonasus*) and American bison (*Bison bison*), as well as in cattle (*Bos taurus*), usually in tropical and subtropical parts of the world. The origin of infection in cattle in British herds is often not determined; risk factors include the purchase of bison, buffalo, or other affected species, or via fomites from such infected animals. The life cycle of *T. vitulorum* is different from the more common gastrointestinal parasites of the UK, as the larvae undergo migration and arrested development within somatic tissues of the adult cows, and there is 'lactogenic' transmission to suckling calves in milk (Roberts 1990). Infection in adult cattle is asymptomatic, and calves may show no signs; this may account for the parasite being undetected in herds. In some infected calves

there are relatively mild signs such as diarrhoea and poor thrift, but as with ascarid parasites in other species such as pigs, dogs and cats, the presence of the large nematodes in the intestine can occasionally cause intestinal obstruction. Worm egg counts and postmortem examinations can confirm the presence of this parasite, and where infected herds are identified, preventive anthelmintic treatment of young calves is recommended (Roberts 1992).

Figure 3: Adult ascarid worms identifiable in faeces of a one-month-old suckler calf (image kindly provided by the private vet)

Reference:

https://www.thecattlesite.com/articles/2954/toxocara-vitulorum-found-in-calves-vla-report

Laboratory diagnosis of gastrointestinal nematodes (GIN) in first grazing season cattle

A recent APHA Veterinary Record focus article discussed the importance of having a greater understanding of gastrointestinal nematode (GIN) infections in cattle. To improve our understanding of the composition of GIN infections, a survey of first grazing season cattle was undertaken across the England and Wales surveillance network. During the 2020 and 2021 grazing seasons, first grazing season cattle that were submitted to Animal and Plant Health Agency (APHA) Veterinary Investigation Centres (VICs) and partner PME providers for PME (for any reason) were sampled by abomasal and small intestinal washing. Representative aliquots underwent total worm count (TWC) at APHA Carmarthen VIC to provide an estimate of the numbers and species of nematodes present. Faecal egg count (FEC) was also carried out using the modified, improved (centrifuge-enhanced) McMaster technique with a sensitivity of 50 eggs per gram (epg).

Within our sample of 51 first grazing season cattle submitted for PME (for any reason) during the 2020 and 2021 grazing seasons the main findings were:

- GIN infection was common: 49% had FEC >50 epg; and 71% had nematodes detected by TWC
- *Ostertagia ostertagi* and *Cooperia oncophora* were the predominant species
- Wasting and diarrhoea were commonly reported with GIN infection but, were not pathognomonic
- In all animals with a FEC ≥150 epg, GIN were detected by TWC
- For those with a FEC <150 epg, GIN were detected in approximately half
- For those with a FEC <50 epg, *Ostertagia ostertagi* was the most commonly detected species.

The full article can be found at:

Laboratory diagnosis of gastrointestinal nematodes in first-grazing-season cattle

Respiratory system

Lungworm 'Husk' in a 5-year-old bull in May

The carcase of a 5-year-old bull from a dairy herd was examined postmortem at Starcross VIC. It had been with cows at pasture and exhibited signs of respiratory disease for three days before it died, despite treatment with antibiotics and anti-inflammatories. Severe necrotising inflammation of the upper respiratory tract mucosa was present, extending from the larynx to the bronchi. There was also purulent lung consolidation, pleuritis and purulent inflammation of the right retro-pharyngeal lymph node. The presence of *Dictyocaulus viviparus* infection indicated a diagnosis of husk, and PCR testing was positive for bovine herpesvirus-1, confirming infectious bovine rhinotracheitis (IBR). The bull had not been vaccinated for either husk or IBR.

As for the PGE cases discussed above, this case occurred earlier in the grazing season than expected. Husk should be considered in cattle of any age if they are at pasture and exhibit coughing.

Influenza D Project

The APHA Mammalian Influenza team are continuing to investigate whether Influenza type D virus is present in the UK, and whether it may be contributing to bovine respiratory disease as a new and re-emerging threat. Samples are usually accepted, following discussion with an APHA veterinary investigation officer (VIO), from cattle with acute respiratory signs (e.g pyrexia, cough/ dyspnoea; and/or clear nasal discharge). Samples from adult dairy cattle with milk drop and/or respiratory signs can be accepted on a case-by-case basis and, after discussion with the project lead, or a VIO.

Musculoskeletal system

Musculo-skeletal deformities in a suckler herd with unknown aetiology

Eight calves, from a group of 35 third parity Limousin cows, were born bright but with contracted tendons in the forelimbs, which had resulted in an inability to rise and move around. The cows were fed hay ad-libitum, silage, and carrots. Two bulls were used to sire the affected group of calves, of which one was only recently introduced. A similar presentation had occurred sporadically in the past. The dams of the affected calves had been on farm for four years and no previous signs suggestive of Schmallenberg virus infection (SBV) had been recorded. The herd was BVD vaccinated. The cattle were pastured from June to October 2022 on wetlands, where the presence of potentially toxic plants could not be excluded.

At postmortem, the gross findings confirmed the clinical description of the forelegs, which were locked in flexion. No gross changes were seen in the joints or tendons. The calf tested negative for Schmallenberg virus by PCR, and histopathology of brain and spinal cord revealed no abnormalities.

This presentation is generally linked to reduced fetal movement in utero, which can be due to fetal (central or peripheral neurogenic, or myogenic lesions) or maternal abnormalities (e.g. hyperthermia, reduced uterine volume, increased myometrial tension, etc.).

The aetiology was not determined but would potentially include:

- An infectious cause, that was not detected on the testing undertaken (as above). Monitoring of the herd for any other cases or clinical signs was advised.
- Hereditary, by recessive genetic expression manifesting inconstantly in the group as linked to the sires or dams. A review of any potential genetic links between the affected calves was advised.
- Toxic. There was a potential exposure to toxic plants in a susceptible gestational period between June and October 2022 when these cows would have been 50-80 days pregnant. Hemlock (*Conium maculatum*) is the one most frequently involved in similar cases in the UK, but also certain species of *Lupinus spp,* and *Nicotiana spp* have also been implicated. Further investigation regarding potentially toxic plants on the relevant pasture was advised.

Urinary system

No significant trends this quarter.

Nervous system and organs of special sense

Listerial encephalitis

Two spring-born weaned suckler calves were received for postmortem examination. One other animal with ill-thrift had previously died in the group of 25. One of the submitted animals had died, the second was euthanased by the practitioner as it had developed recumbency, paddling of its limbs, and opisthotonos. Both calves were in good condition, but both had lung pathology suggestive of respiratory disease. The euthanased calf was in fair condition, weighing 173kg. The brain of the euthanased calf had mild green discolouration around the Circle of Willis on the ventral surface; although there was no autofluorescence when viewed under ultraviolet light. No bacteria were isolated from the brain but, histopathology confirmed an acute to subacute necrosuppurative encephalomyelitis and mild meningitis, with clusters of gram-positive coccobacilli within the affected brain lesions, consistent with *Listeria monocytogenes* infection. Listerial encephalitis is most often diagnosed in growing animals and adult cattle and is rare in unweaned calves. The source is commonly spoilt silage, although in this case the animals were only receiving hay, straw and concentrate. *Pasteurella multocida* and *Mannheimia haemolytica* were isolated from the lungs of the two calves, no viral pathogens were identified by PCR, and *Mycoplasma bovis* infection was confirmed in both by DGGE/PCR.

Meningitis due to Clostridium septicum

A suppurative meningitis was the main gross finding, in a one-month-old suckler calf which presented with malaise prior to death. Gross examination also revealed recent disbudding wounds on the skin of the cranium. Aerobic brain cultures were sterile however, on anaerobic culture *Clostridium septicum* was isolated in heavy pure growth. Brain histopathology confirmed meningitis, and suggested *Fusobacterium* sp. involvement, with the intensity of infection under the right horn bud suggesting this may have been the original site of infection. Additionally, in the thalamic region, lesions were more suggestive of *Clostridium* spp. infection which correlated with the bacteriology results. This organism was deemed to have potentially arrived haematogenously from another site and colonised areas of existing tissue damage. A review of disbudding technique was recommended.

Skin

Cutaneous lymphoma in a dairy cow

A practitioner contacted APHA field services to discuss the possibility of lumpy skin disease or lymphoma, manifesting as multiple skin lumps in a dairy cow which was otherwise healthy. Biopsy sampling of some of the lumps was undertaken. Histopathology confirmed epitheliotropic lymphoma, raising the possibility of enzootic bovine leucosis (EBL). This updated information was reported to APHA field services, and EBL was then negated following testing. Cutaneous lymphoma can be part of generalised lymphomatous pathology or, can be the sole manifestation of neoplasia in some animals.

Circulatory disease

Idiopathic immune mediated anaemia

A seven-year-old suckler cow was submitted to investigate the cause of anaemia and death. The cow initially presented as knuckling over in the hind legs and difficulty standing. It also displayed some aggressive behaviour and died shortly after examination. The PCV was 6%. On gross examination, multiple ticks were found in the axilla and groin region. The carcase was noted to be very pale in colour with a degree of icterus throughout. There was a significant amount of watery bloody fluid within the thoracic cavity. Blood smears were examined and there was no evidence of babesiosis. Cultures from liver produced no growth. Further examination of tissue described a pattern of haemolysis and anaemia but not a specific cause, but immune-mediated was thought most likely. There was no indication of bracken poisoning from examination or history, and other potential causes such as copper or brassica toxicity were not really indicated in this case. Further PCR testing was carried out for babesiosis and leptospirosis and these were both negative.

Suspect blood platelet dysfunction

A sporadic blood platelet dysfunction disorder was diagnosed in a two-day-old Aberdeen Angus-cross calf, which had continuously bled when ear tagged. The cows were vaccinated for BVD, but ‘Pregsure’ had never been used on the farm. Subcutaneous pallor (Figure 4), widespread haemorrhage, and jaundice were detected in the carcase and histopathological examination confirmed multifocal haemorrhages consistent with a bleeding diathesis. The bone marrow was normal which excluded primary thrombocytopaenia, and the presence of fibrin within the lung suggested that the coagulation cascade was functional. Secondary thrombocytopaenia could not be ruled out, as there was no ante-mortem blood available to do platelet counts, however alloimmune thrombocytopaenia seemed unlikely as a ZST result of 6 turbidity units showed poor antibody levels in the calf. Antibody to BVDV was detected, however in-utero BVDV infection was ruled out by Pestivirus PCR on the spleen. Hereditary thrombocytopathy has been reported in Simmental cattle, however no case reports for Aberdeen Angus cattle could be found.

Figure 4: Pallor and jaundice in a two-day-old Aberdeen Angus cross calf with a suspect sporadic blood platelet dysfunction disorder

Reproductive system – abortion, stillbirth, and congenital deformities

Investigation of Intra-uterine growth retardation (IUGR) of unknown origin

Investigation of 'intra-uterine growth retardation of unknown origin' is ongoing at SRUC St Boswells, where cases have been reported from five separate suckler herds. Small calves (less than 20Kg) (Figure 5) presented as late term abortions, stillbirth, or perinatal losses. Abnormal placentae with a white surface, and very oedematous stroma, are common (Figure 6). Thick amniotic membranes that are difficult to break at birth have also been noted. At present we suspect that this is an issue related to placental development.

Figure 5: A small full-term calf with poor muscle mass

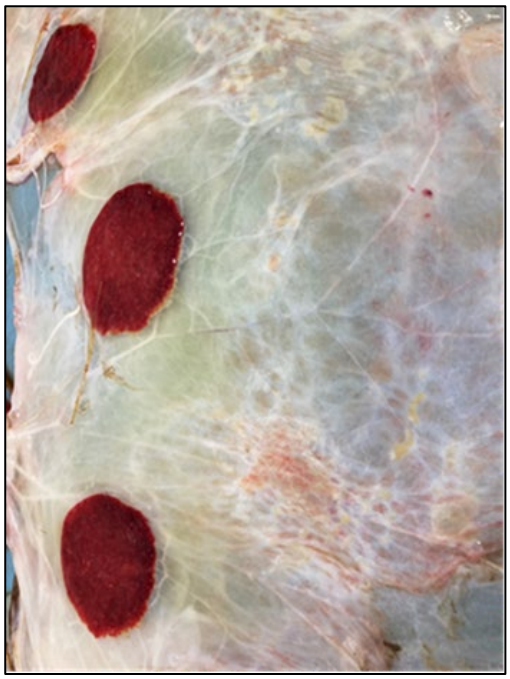


Figure 6: Placenta from the same case as Figure 4, with oedema of the chorioallantoic stroma and multifocal white patches on the surface

Mycotic placentitis cases

Mycotic placentitis was established as the cause of fetopathy following the submission of a third trimester fetus from a 950-cow dairy herd. The herd has recorded an increased abortion rate in recent months and so investigation and examination were advised to assess potential aetiologies. The herd vaccinated against Salmonella, BVD and IBR, and neosporosis had been identified several years previously. Routine cultures of fetal stomach contents recovered *Candida spp* in mixed growth and so histological examination of the placenta was undertaken to evaluate this finding. A moderate, multifocal, acute, suppurative placentitis, with intratrophoblastic yeasts was observed. It was advised that such incidents are often sporadic, and therefore examination of subsequent abortion material was proposed to establish whether other infectious aetiologies were involved.

Fungal placentitis was the diagnosed as the cause of abortion in a suckler cow, which was the third to abort over a three-week period. The group were housed and fed grass silage. The fetus itself was grossly unremarkable however, the gross pathology of the placenta suggested mild necrosis of the cotyledons, with some appearing congested and surrounded by a yellow border of tissue. The intercotyledonary tissue was multifocally oedematous (Figure 6). Stomach content cultures were sterile, and no fungal hyphae were seen on microscopic examination of a placental impression. However, histopathology identified severe fibrinosuppurative placentitis with intralesional branched fungal hyphae, resembling *Aspergillus* sp., *Mucor* sp. or *Rhizopus* sp. Housing and diet were deemed to be the likely risk factors for exposure of pregnant animals to fungal spores.

These two cases illustrate the value of both submitting placenta for abortion investigations, and of histological examination of the placenta for certain cases.

Figure 7: Mild necrosis of the cotyledons and oedema of the inter-cotyledon tissue in a case of fungal placentitis

Border disease infection

Two aborted calves were submitted from a herd of 47 breeding suckler cows and heifers. One other cow had aborted six weeks previously in the group, which were vaccinated against BVD and leptospirosis. Neither of the calves, which weighed 25kg and 27kg, had specific gross pathology. No bacteria or viral pathogens were identified, nor Neospora, but border disease virus was detected by PCR in one of the calves. This pestivirus is of course predominantly identified in sheep but has been detected in cattle, associated with abortions as in this case, and in animals with lesions consistent with mucosal disease (Cranwell and others 2007). Its identification in the herd is significant and further investigation for the presence of the virus was recommended.

Reference

Cranwell MP, Otter A, Errington J, Hogg RA, Wakeley P, Sandvik T. Detection of border disease virus in cattle. *Veterinary Record* 2007:161: 211-212

https://doi.org/10.1136/vr.161.6.211-a

Presumptive case of congenital cerebral oedema (CCO) in two Hereford calves

A Hereford beef suckler herd had one abortion and two calves born with nervous signs. The two calves with nervous signs were sired by the same Hereford bull, who entered the herd in 2020, aged 18 months. Normal calves had been born to both dams and the bull in previous years. The cows were healthy and at pasture with access to a shelter. No cattle

had been purchased in the previous 12 months. The cows were not vaccinated and had no disease accreditation.

Clinical signs in both calves were of vertical nystagmus and marked head tremor, which worsened on stimulation. Calves paddled when encouraged to stand. The calves never stood and neither received any colostrum. Both calves were euthanased at less than six hours of age and submitted for postmortem examination. The smaller calf was one of twins, with the other twin being healthy. The dams of both were related. The sire did not share common ancestors with the dams.

There were no gross lesions to account for the nervous signs. Neospora DNA and Schmallenberg virus nucleic acid were not detected by PCR in brain of either calf and BVD virus was not detected by PCR on spleen in either. No significant bacteria were cultured from the brains.

The histopathologists reported that changes observed in the brain were striking and diffuse. Both grey and white matter were affected with marked status spongiosus. Given the clinical history, age, breed, and being sired by the same bull this appeared to be a case of a genetically inherited status spongiosus, which would fall within several autosomal recessive diseases described in Hereford cattle. A presumptive diagnosis of congenital cerebral oedema (hereditary neuraxial oedema of Hereford calves) was made in both calves from histological examination of the brains.

Mastitis

No significant trends for this quarter.

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 2021 has been published by the Veterinary Medicines Directorate (VMD):

Veterinary Antimicrobial Resistance and Sales Surveillance 2021 - 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: Reports – RUMA

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

No significant trends this quarter.

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 animals 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: https://www.gov.uk/government/collections/animal-diseases-international-monitoring.

Epizootic Haemorrhagic Disease (EHD): In May, outbreaks of EHD were reported in Italy (1).

Foot and Mouth Disease (FMD): In May, several FMD outbreaks were reported. Serotype O was reported in China (2), Palestine (1), South Korea (11) and Tunisia (59). Serotype SAT 1 was reported in Comoros (1). Serotype SAT 2 was reported in Iraq (11) and South Africa (1). (WOAH data only). In June, several FMD outbreaks were reported. Serotype O was reported in Tunisia (2). Serotype SAT 2 was reported in Iraq (5) and South Africa (1). Serotype Pending was reported in Malawi (3) and Rwanda (1).

There remains a low risk of FMD incursion into the UK from any affected region.

Lumpy Skin Disease (LSD): In May, there were reports of LSD in Israel (1). In June, there were reports of LSD in Libya (3) and Israel (2).

Bluetongue (BTV) update

Bluetongue (BTV): The risk of BTV incursion to the UK during May and June was classed as low. Animals travelling to or from BTV-affected areas of Europe, and back to the UK, must be vaccinated against both BTV-8 and BTV-4. Further advice on how to spot and report BTV can be found at www.gov.uk/guidance/bluetongue.

Focus on Bluetongue virus

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, which include lethargy, crusting erosions of the muzzle, hyperaemia of the coronary band, pyrexia, milk drop, and teat erosions.

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

In-utero infection of ruminants can result in hydrancephaly (Figure 8), 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.**

A good overview of BTV disease can be found here:

Bluetongue disease - Part 2 Transmission, clinical signs and pathology in sheep - YouTube

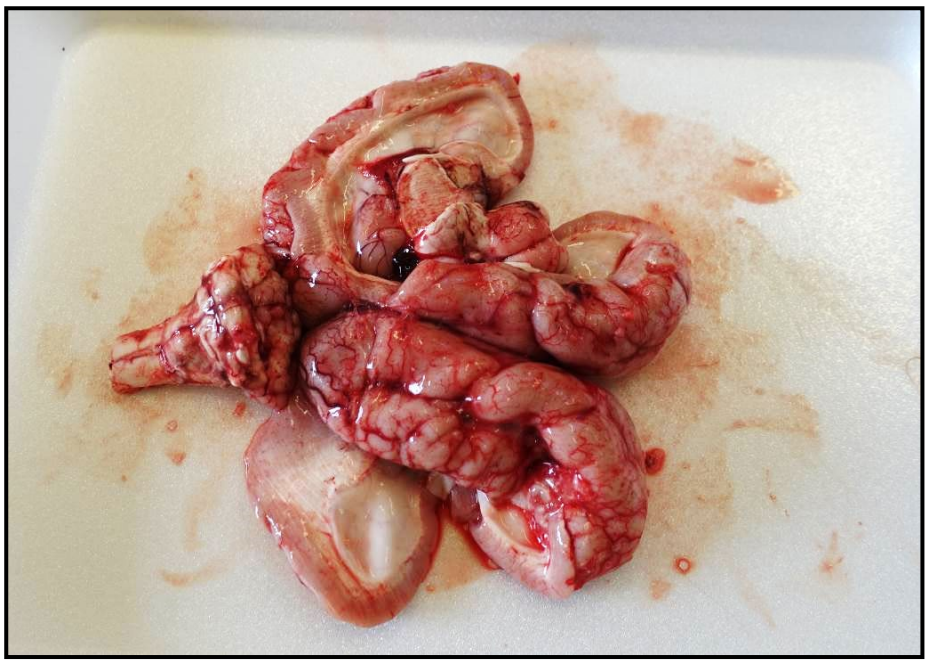


Figure 8: Cavitational brain lesions in a neonatal calf; for which gestational infection of the dam with viruses such as Bluetongue virus, Schmallenberg virus, and BVDV should be considered

Publications of interest

APHA (2023) Disease surveillance in England and Wales, April 2023. Veterinary Record 192 (9) 360-363. Disease surveillance in England and Wales, April 2023 - 2023 - Veterinary Record - Wiley Online Library

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

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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

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