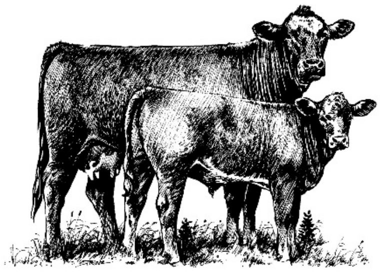

GB cattle quarterly report

Disease surveillance and emerging threats

Volume 28: Quarter 2 (April - June) 2024

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Introduction and overview

This quarterly report reviews disease trends and disease threats for the second quarter of 2024 (Q2), 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 industry update for Q2 2024

- **Prices:** UK farmgate milk prices averaged 37.92 pence per litre (ppl) in May, which was down 0.49ppl (1.3%) on the month. In July, we saw price increases across most contracts on the AHDB league table. In particular, strength was seen in cheese and manufacturing contracts, with all reported contracts recording increases in the range of 0.20ppl to 1.50ppl.
- **Production:** UK milk production totalled 3,963 million litres for the second quarter of 2024, back 0.8% on the same period of the previous year. Challenges caused by an exceptionally wet Autumn, Winter and Spring meant that the volumes were subdued over the flush, hitting peak production in mid-May. Improved grass availability gave support to production in June, with the revised AHDB forecast predicting year on year uplifts in production for July and August.
- **Trade:** Year-to-date (Jan-May) volumes of dairy exports from the UK totalled 559,700 tonnes, a 2.3% increase compared to the same period of the previous year. These exports were valued at £735 million. Import volumes for the same period were 489,000 tonnes, a slight increase year on year.
- **Demand:** During the 52 weeks ending 15 June 2024, volumes of cow's dairy sold in retail declined by 0.5% year-on-year but spend increased by 2.4% as inflation caused a 2.9% rise in average prices paid (Copyright © 2024 Nielsen Consumer LLC. All Rights Reserved).

Beef industry update for Q2 2024

- Prices: GB deadweight prime prices were flat throughout April, before easing slightly from mid May and throughout June. The all prime average deadweight cattle price began the quarter at 486.2p/kg in the week ending 6 April and moved down to 476.9 p/kg for the week ending 29 June.
- Production: UK beef production totalled 70,600 tonnes in June, down 7% year on year. On the contrary, both April and May saw production volumes up compared to the previous year's figures, totalling 76,200 tonnes and 78,300 tonnes respectively. Prime cattle slaughter fluctuated throughout the quarter. Prime carcass weights were flat on the year, at 344.3kg in June.

- Trade: In terms of UK beef trade, imports of fresh & frozen beef totalled 18,700 tonnes in May, back 8% YOY. Export volumes sat at 9,500 tonnes for the month, up 20% YOY. For the YTD (Jan-May) beef imports stood at 99,900 tonnes (+10% YOY), while exports totalled 46,400 tonnes (+11% YOY).
- Demand: In the 12 weeks to 7 July, spend on beef in retail increased by 3.7% year-on-year, and volumes increased by 0.7% (+882 tonnes). Prices paid rose by 2.9% on average across all beef products. Total primary beef volumes purchased grew by 2.8% year-on-year, driven by mince. Mince saw volumes purchased increase by 6.3% due to an increase in frequency of purchase. Roasting also saw slight volume growth (0.1%) due to an increase in shopper numbers.

Acknowledgment for the dairy and beef updates: Becky Smith, AHDB

Cattle disease surveillance dashboard outputs

The most frequent diagnoses from carcase submissions made in the second quarter (Q2) of 2024, compared to Q2 in 2023, and Q2 for 2015 to 2024 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 of 2024, Q2 of 2023, and Q2 for 2015-2024

10 most frequent carcase diagnoses Q2 2024	10 most frequent carcase diagnoses Q2 2023	10 most frequent carcase diagnoses Q2 2015-2024
1. Navel ill +/- joint ill	1. Pneumonia due to *Pasteurella multocida*	1. Navel ill +/- joint ill
2. Pneumonia due to *Pasteurella multocida*	2. Pneumonia due to *Mannheimia haemolytica*	2. Hypogammaglobulinaemia
3. Pneumonia due to *Mannheimia haemolytica*	3. Digestive disease due to other causes (not listed)	3. Pneumonia due to *Mannheimia haemolytica*
4. Colisepticaemia	4. Abomasal ulceration	4. Respiratory – other cause (not listed)
5. Pneumonia due to *Mycoplasma bovis*	5. Navel ill +/- joint ill	5. Digestive disease due to other causes (not listed)
6. Abomasal ulceration	6. Pneumonia due to *Mycoplasma bovis*	6. Cryptosporidiosis

7. Respiratory – other cause (not listed)	7. Respiratory – other cause (not listed)	7. Colisepticaemia
8. Hypogammaglobulinaemia	8. Coccidiosis	8. Pneumonia due to *Pasteurella multocida*
9. Intestinal torsion (red gut)	9. Colisepticaemia	9. Pneumonia due to *Mycoplasma bovis*
10. Digestive disease due to other causes (not listed)	10. Congenital abnormality	10. Coccidiosis

An example of a diagnosis for the 'respiratory diagnoses not listed' category, for this quarter, was necrotic laryngitis in an animal which also had pneumonia due to *Histophilus somni*. Necrotic rumenitis was one of the diagnoses not listed for 'digestive disease due to other causes'.

New and re-emerging diseases and threats

Bluetongue serotype 3 (BTV-3) update

By the end of Q2 2024 there had been reports of confirmed cases of BTV-3 in the Netherlands and Germany. No BTV was detected in the UK during this quarter, with the last detection having been during March 2024. The picture for BTV-3 is changing rapidly during Q3 2024 (at the time of writing) both in Great Britain and in other countries. The latest information on BTV cases and the interactive map can be found at: Bluetongue: news, information and guidance for livestock keepers - GOV.UK (www.gov.uk)

Schmallenberg disease

Diagnoses of bovine fetopathy due to Schmallenberg virus (SBV) continued to be reached, with a total of 68 cases confirmed by PCR testing in England and Wales in Q2 of 2024. Of these, 36 were in suckler herds and 29 in dairy herds (Figure 1). Several of these submissions, where maternal bloods were available, were also antibody positive for SBV.

Affected calves were either aborted in late gestation, were stillborn, died within minutes of birth, or required euthanasia shortly after birth. Typical gross pathological signs including arthrogryposis (Figure 2), scoliosis, torticollis, skull deformities, and brain deformities (Figure 3) were detected. Bluetongue virus infection is a differential diagnosis where brain lesions of hydranencephaly or porencephaly are seen.

In two sets of twins from two separate farms, one calf was born normal, and the other one had abnormalities consistent with SBV infection and then tested PCR positive for SBV on brainstem testing.

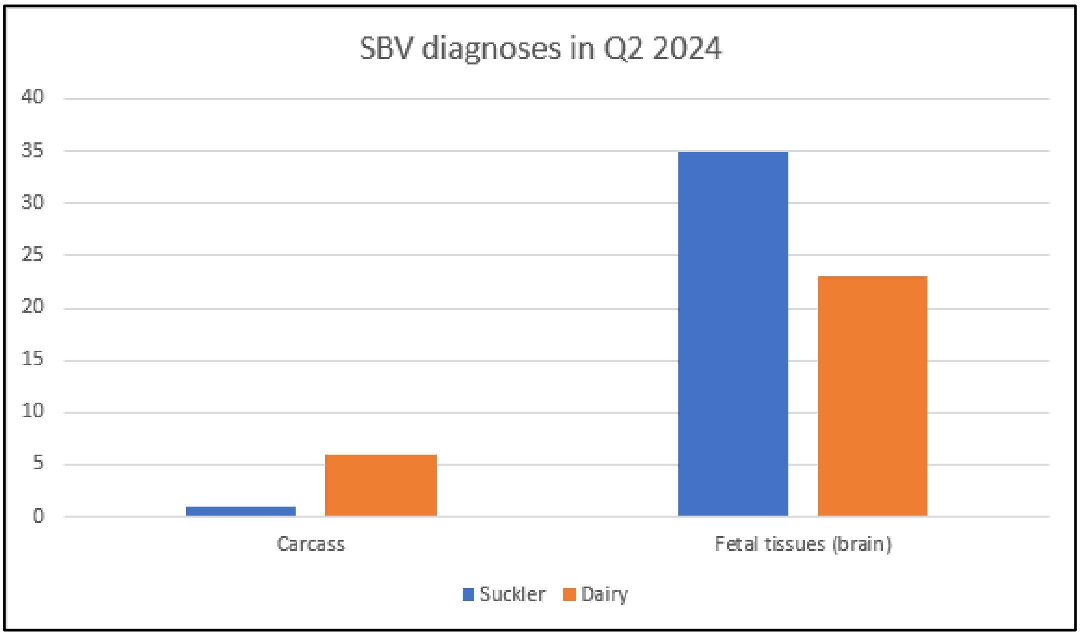

Figure 1: Numbers of positive Schmallenberg virus PCR tests in Q2 2024 in carcases and fetal tissues and also comparing suckler herds with dairy herds

Figure 2: Arthrogryposis in a Schmallenberg virus positive calf

As reported in Q1, cases continued to show a westerly geographical distribution. The distribution of diagnoses is shown in Figure 4. The cause of this is uncertain, but is likely to be linked to the climate, midge populations, and herd immunity during gestation.

Figure 3: Brain deformities in a Schmallenberg virus positive calf

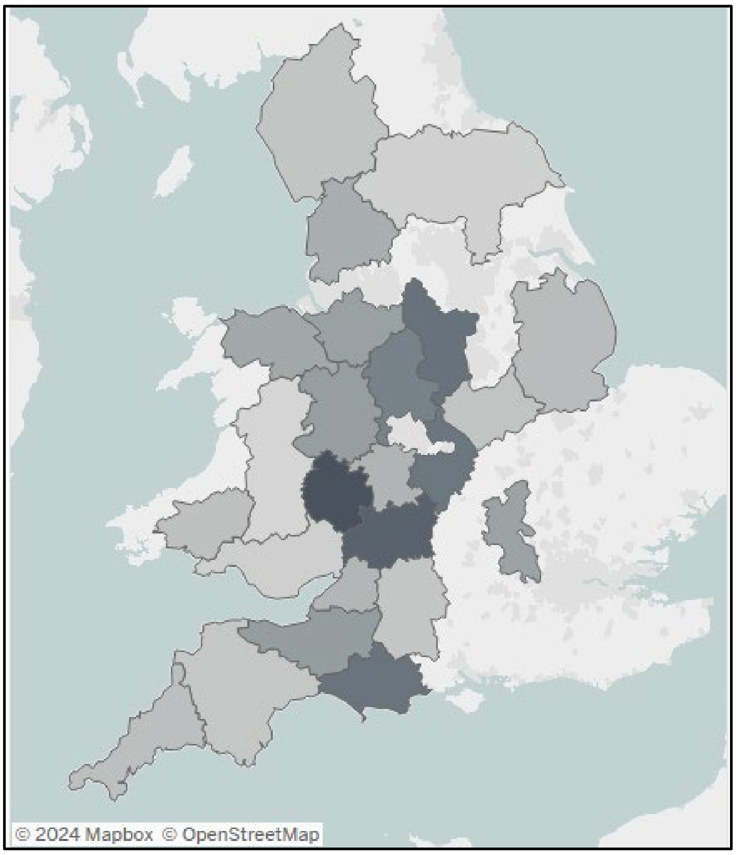

Figure 4: Geographical distribution of SBV cattle diagnoses in GB from 1.4.24 to 30.6.24

In some cases, congenital abnormalities prompted whole carcases to be submitted for investigation into SBV infection. In three of these, alternative diagnoses were made. A stillborn dairy calf was submitted after presenting with hindlimb arthrogryposis.

Postmortem examination additionally revealed atresia ani and elongation of the skull, with a widened foramen magnum, and with subtle changes to the architecture of the brain. SBV PCR testing of brain tissue was negative, and histopathology confirmed a diagnosis of Arnold Chiari Malformation. This affects the structure of the hindbrain and caudal fossa resulting in herniation of the brain into the foramen magnum (Figure 5). Cases are reported sporadically in UK cattle.

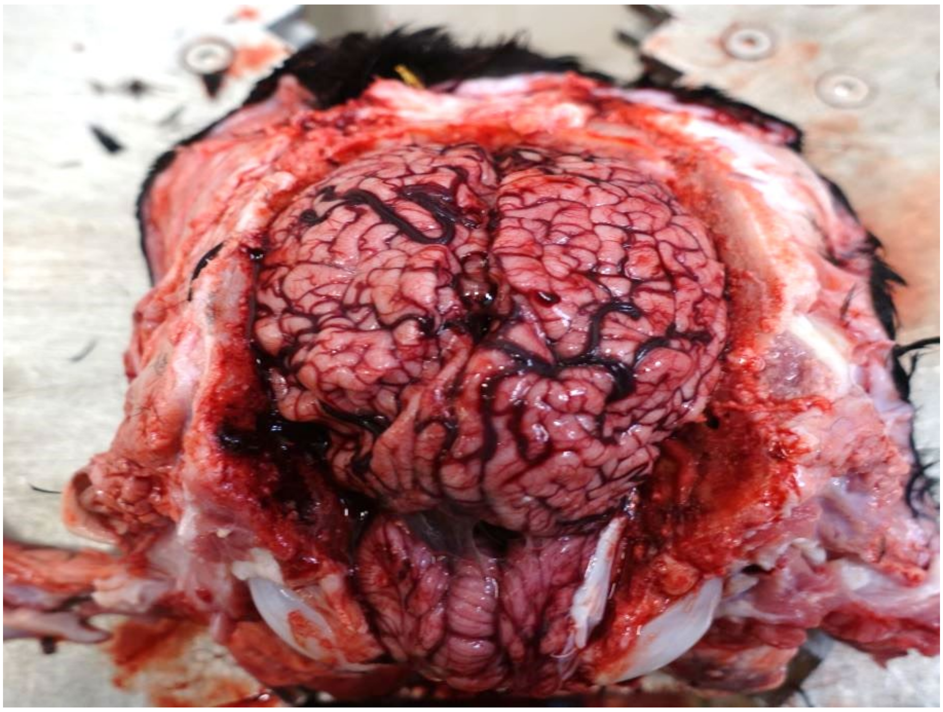

Figure 5: Cerebellar abnormalities in a calf with Arnold Chiari malformation

Figure 6: A calf with deformities consistent with Schistosomas reflexus

In another case, deformities included a connecting right nares and hard palate, marked scoliosis, a missing right forelimb, syndactyly of the left forelimb, ankylosis of the hocks, an undersized thoracic cavity, and no abdominal cavity (Figure 6). There were no gross abnormalities of the CNS. Tests for BVD and SBV were negative and a diagnosis of schistosomus reflexus was made. Schistosomus reflexus is a rare, congenital abnormality. Cases are usually sporadic within a herd, although there is believed to be a genetic aetiology in some cases. In this case, the calf had been sired naturally by a bull that had been used for several years in the herd without issue.

Changes in disease patterns and unusual diagnoses

Systemic disease

Omphalophlebitis in a calf due to *Trueperella pyogenes*

Navel ill was the most common carcase diagnosis from Q2 2024. A three-week-old calf was submitted after having died following a short period of recumbency. It was one of 48 calves bought in from the same holding four days previously. The calves were being fed two litres of milk twice daily, with ad lib straw and automatic water drinkers, and with concentrates having been introduced the day the calf died. The calf was in sub-optimal body condition. Postmortem examination (PME) and cultures confirmed the calf had omphalophlebitis, with a resultant *Trueperella pyogenes* septicaemia. *T. pyogenes* is an opportunistic pathogen, commonly associated with pyogenic infections in cattle. Testing for BVD was negative. Given the history, a thorough review of calf nutrition was recommended, including volume of milk fed, as two litres of milk replacer twice daily was not likely to be sufficient for a calf weighing 48 kg. It was also recommended that concentrates are introduced from an early age to encourage rumen development. See [Feeding dairy calves | AHDB]

Colisepticaemia in a group of dairy calves

Colisepticaemia was the fourth most common diagnosis this quarter. A four-day old Belgian Blue-cross calf was submitted from a 180-milking-cow herd. It was reported that six calves had been affected and had died at approximately three to four days of age. The affected calves were born a robust size with some requiring a little assistance at calving, and they were left in the calving yard to suck colostrum from the dam for two days. At three days of age the calves were fed their dam's milk via a bottle, at two litres twice daily. Postmortem examination revealed multiple haemorrhages within the abomasum and brain, which was also oedematous and had meningeal opacity. There was also inflammation in multiple joints, the navel was thickened and inflamed, and there was a lack of staining of the skin from navel treatment. *E. coli* was cultured from joints and brain, confirming colisepticaemia, likely from an ascending navel infection. The antibiotic sensitivity testing of the *E. coli* identified resistance to multiple antibiotics. Multiple resistance profiles in young calves can be attributed to feeding waste milk on farm. Rotavirus was also detected by ELISA from faeces. Improved management of neonatal calves was recommended, especially navel disinfection. Improved colostrum management, including carrying out some on farm blood total proteins in calves from one to seven days of age, and a review of pen hygiene, were also recommended. Another calf submission that was diagnosed with colisepticaemia had yellow fibrinous material in the atlanto-occipital joint (Figure 7)

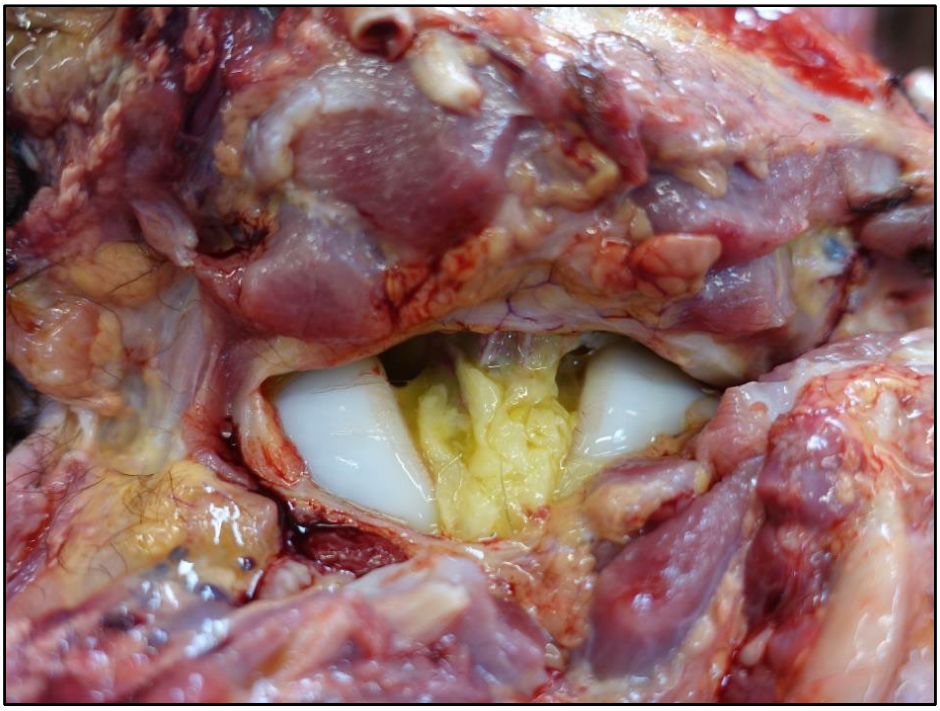

Figure 7: Thick yellow fibrinous material in the atlanto-occipital joint of a calf with colisepticaemia

An outbreak of malignant catarrhal fever in ten-month-old calves

A 10-month-old shorthorn steer was submitted to SRUC-VS to investigate the cause of death. The calf had become unwell three days prior to submission and, had been slow to come forward to feed. It continued to deteriorate and died in the following 48 hours. This was the third animal in the group of 27 to die and another animal was also unwell. Following this submission, a further two animals died and were submitted for examination. A total of five animals died from the group. The group had been weaned in November and housed over winter.

Some animals were examined before submission and showed clinical signs suggestive of malignant catarrhal fever (MCF). The second animal to become unwell also presented with neurological signs including seizures. APHA were consulted to rule out any suspicion of notifiable disease (such as BTV). Approximately six weeks prior to the first case a group of Blue faced Leicester ewes, assumed to be in lamb, were housed in the same building for a couple of days. They were separated from the calves by a three-metre feed passage.

Gross examination of all three animals found lesions typical of MCF. Testing was carried out to rule out other differentials such as IBR and BVD and these were all negative. MCF was confirmed by PCR testing of the spleen in postmortem case and on bloods in earlier cases not submitted. The group was blood sampled in the beginning of April, approximately one month after the last case and samples were tested for both MCF virus

(Ovine Herpesvirus 2 DNA /Real-Time PCR) and antibody (MCF Elisa). Two animals were positive for virus with CT values of 36.85 and 25.15. Ten were antibody positive.

The group was also tested for BVD, and no evidence of infection was detected. Tick-borne fever was also included in the testing and ten animals were found to be positive on PCR. Initially this was thought to be potentially significant as a possible immunosuppressant factor, however it was concluded this was unlikely to be the case. The last exposure to TBF would have been at least four months previously and, as blood can remain PCR positive months after infection, it was thought these results most likely to represent historic infection and not have any bearing on the current outbreak.

MCF in cattle typically occurs as sporadic individual cases and outbreaks such as this are rare. Clinical infection is usually fatal with no treatment for the disease. Sub-clinically infected animals can survive as demonstrated here by the ten animals testing positive for antibodies. Cattle do not spread infection, as infected animals do not excrete the virus. Infection comes from contact with sheep who are asymptomatic carriers. Stress such as handling and lambing can increase shedding in sheep. The incubation period is typically two to 10 weeks and sometimes much longer. In this case the timing of exposure to the group of sheep fits within the typical incubation period. Several factors in this case, such as the opportunity for close contact with the group of sheep for most of the cattle group, and an enclosed environment combined with the assumed high viral shedding from the sheep group, had combined to produce the ideal circumstances for an MCF outbreak.

Digestive system disease

Abomasal bloat and rupture in dairy calves

Abomasal disorders remain a common finding in the PM room, and abomasal ulceration was the sixth most common carcase diagnosis this quarter. Scouring, loss of condition, and the deaths of 27 calves had been reported in a dairy herd of 253 cows since January 2024, with three calves having died in the previous three days. Rotavirus infection had previously been identified. The calves were fed their dams' colostrum and a powdered colostrum substitute, and they were penned individually. The carcase of a one-week-old heifer calf was examined postmortem. The abdomen was distended and there was fluid and ingesta covering the viscera, caused by rupture of the abomasum. Intestinal content was yellow liquid in which cryptosporidia and rotavirus were detected. The cause of abomasal bloat, leading to rupture is uncertain, with several potential risk factors involved:

- Poor immunity from suboptimal colostrum (increasing the risk of gastrointestinal tract infections).
- Feeding milk too fast.
- Poor milk feeding equipment hygiene.
- Incorrect milk powder concentration, suboptimal mixing and/or timing of feeding of milk replacer.
- Intermittent feeding of large volumes of milk.
- Incorrect milk temperature (either too hot or too cold).

- Vitamin and mineral deficiencies (cases of abomasitis and abomasal ulcers may be associated with copper deficiency).

Assessing whether these risk factors were present and then reviewing milk feeding were recommended.

Respiratory system

The incidents of pneumonia due to *Histophilus somni*, as a percentage of diagnosable submissions, have been increasing in GB since 2021. This trend is particularly noticeable for Scotland (Figure 8). *Histophilus somni* was isolated in pure growth from the lung tissue of an eight-month-old beef calf which was found dead. The gross findings included cranioventral lung consolidation and bullae scattered throughout the caudal lung lobes. The viral respiratory PCR testing was negative however, the lung histopathology was suggestive of previous pneumotropic viral insult.

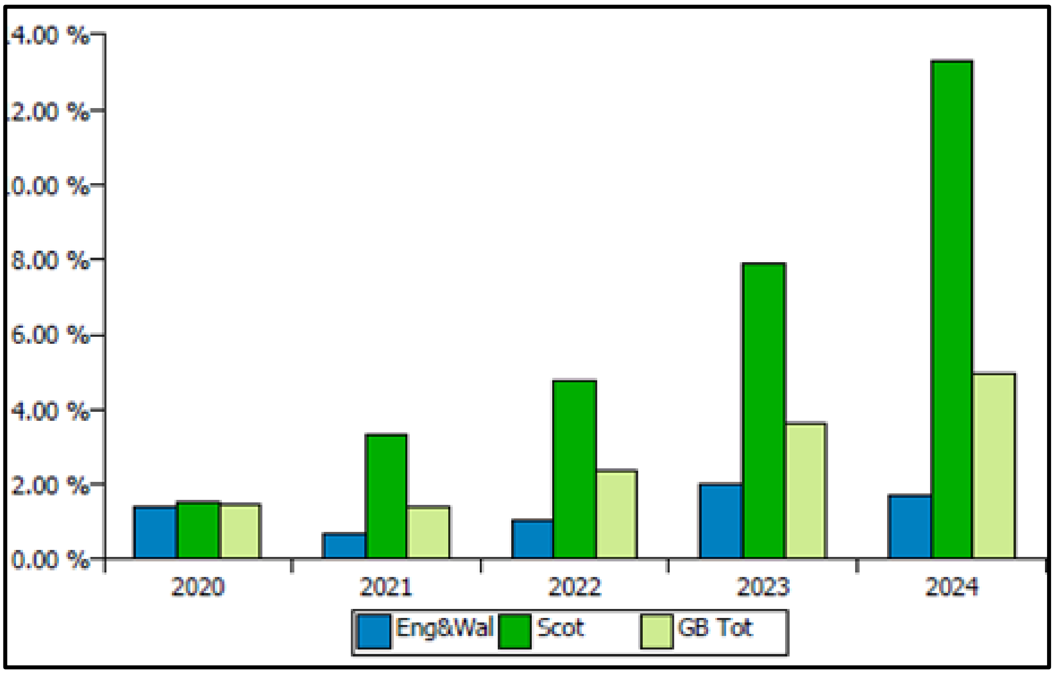

Figure 8: Incidents of *Histophilus somni* pneumonia as a percentage of diagnosable submissions

Pneumonia due to *Mannheimia haemolytica* in an adult Charolais cow

A six-year-old Charolais cow was submitted for postmortem examination to investigate pyrexia and respiratory signs in four cows, two of which had died. At PME, the cow had a severe fibrinous bronchopneumonia, pleuritis, and pericarditis. *Mannheimia haemolytica* (with resistance to tetracycline) was cultured from the lung tissue. Histopathology demonstrated a severe, acute, necrotising fibrinosuppurative bronchopneumonia with a moderate fibrinous pleuritis which was consistent with infection with a member of the *Pasturellacae* family. In adult cattle, normally stressors induced from management changes or physiological stress can predispose animals to infection and outbreaks are usually seen in late winter and spring. *M. haemolytica* is also a common secondary pathogen following infection with other bacterial, viral or mycoplasma species, however testing for respiratory viruses was negative in this case. In addition, histopathology did not detect any obvious lesions that implicated other respiratory pathogen involvement (such as viruses or *Mycoplasmas*), however the damage wrought by the bacterial infection may have been obscuring more subtle changes. *Mycoplasma bovirhinis* was detected in lung tissue. *M. bovirhinis* is not believed to be a primary pathogen but may exacerbate existing disease.

Bulk milk antibody testing results for infectious bovine rhinotracheitis

As for all the respiratory pathogens, infectious bovine rhinotracheitis (IBR), caused by bovine herpesvirus type 1 (BoHV-1), is more common during the housed period. It can spread rapidly and result in significant morbidity and mortality. Disease most often occurs in animals of six months of age or older, including adults, and is rare in young calves. The use of vaccination, particularly in dairy herds, has reduced the prevalence of disease in recent years. As it is caused by a herpesvirus, latently infected animals can introduce the infection, and good biosecurity is necessary to prevent entry of BoHV1 into naïve herds. In addition, susceptible stock can be infected following purchase, and knowing the IBR status of both herds is important when considering the introduction of new animals.

Table 2 shows the proportion of National Milk Records (NMR) bulk milk samples testing positive for IBR gE antibody (used for herds vaccinating with a gE deleted IBR vaccine), by ELISA. This data is kindly provided under agreement from National Milk Records (NMR) to support the collection of disease surveillance information across GB. APHA collaborates with private laboratories in a variety of ways. NMR provide milk and blood serology testing for endemic disease in GB cattle. Testing is carried out primarily at the request of vets. Most of the samples tested are routine quarterly surveillance ('monitoring'), but a few may be part of a clinical disease investigation ('diagnostic'). These sample types are not differentiated in Table 2, and the number of samples tested is not shown.

Table 2: Proportion (%) of National Milk Records (NMR) bulk milk samples testing positive for IBR gE antibody by ELISA, by country and by quarter

Country and Quarter	2023 Q1	2023 Q2	2023 Q3	2023 Q4	2023 Q1-Q4	2024 Q1	2024 Q2
GB	73.3	74.3	83.8	81.7	78.1	74.4	52.5
England	73.1	72.7	84.3	81.2	77.6	73.9	52.0
Scotland	100	94.4	88.2	94.7	94.4	100	89.5
Wales	71.1	84.8	78.7	83.5	78.9	73.8	48.8

For further information on this data and please contact vetenquiries@nmrp.com.

Musculoskeletal System

No significant trends this quarter.

Urinary System

No significant trends this quarter.

Nervous system and organs of special sense

Congenital cataracts in a dairy herd

A one-week-old, 21kg dairy calf from a spring calving herd was submitted to investigate the cause of undersized calves with ataxia, stargazing, and apparent blindness. At the time of submission only dairy heifers (6/30), born to sexed semen, from three different bulls, were affected. As calving progressed, beef calves were also affected, and calves were born with grossly visible cataracts. Artificial insemination took place during the hot weather conditions in June 2023. The herd had had a higher barren rate than usual, at 15% compared to 8%. Cows were vaccinated against BVD, Leptospirosis and IBR and had received a winter ration of grass and whole crop silage, plus a twice- yearly mineral bolus.

The calf was submitted alive. It was undersized. The pupillary light reflex (PLR) was intact but, the calf was apparently blind and had bilateral strabismus (Figure 9). There were no other neurological deficits. Grossly, the brain and spinal cord were normal. Histopathological examination confirmed bilateral cataracts and did not detect further CNS abnormalities. Serum Vitamin E and A levels both fell significantly below the reference ranges (Table 2). Assays for liver copper and selenium had normal results and the calf was BVD negative.

Figure 9: Strabismus in a neonatal calf with congenital cataracts

Table 1: Trace element and vitamin assay results for a neonatal calf with congenital cataracts

Test	Ref Range	Units	Result
Copper (Liver)	314-7850	µmol/kg DM	4900.0
Selenium (Liver)	0.9-1.75	mg/kg DM	1.68
Vitamin A (Serum)	249.21 – 501.29	ug/l	142.00
Vitamin E (Serum)	1.3-7.8	mg/l	0.7

The clinical signs in these calves were a result of congenital cataracts. Congenital cataract formation can be caused by a wide variety of insults in-utero from Day 17 of gestation onwards. In this case, genetic causes are unlikely due to the variety of bulls that were used. Infectious causes include BVD, BTV, and Akabane virus, septicaemic processes, and *Neospora caninum*, all of which were ruled out in this outbreak. Other proposed causes are nutritional imbalances, namely Vitamin A and E deficiencies, mycotoxins, and toxic agents (e.g., plants, medicines), increased antioxidant levels, and oxidative stress caused by lipid metabolism (i.e., negative energy balance), and environmental factors e.g., electromagnetic radiation.

In this case, a nutritional cause seems most likely, although interpretation of serum vitamin A and E levels must be done with caution in neonates because they can be low due to insufficient absorption of colostrum. Furthermore, as the cataract development is an historical event, vitamin deficiencies, and indeed metabolic disturbances, were likely to have been corrected in the herd by the time of calving. However, it was recommended that the metabolic, trace element and vitamin status of the herd was investigated at the time and monitored during the next breeding season, including analysis of any remaining forage. Beta-carotene levels are expected to be adequate in UK forage, but two exceptionally dry springs may have resulted in sub-optimal levels.

Infectious bovine keratoconjunctivitis in Holstein heifers

Three conjunctival swabs were submitted from housed Holstein heifers to investigate an ongoing problem with infectious bovine keratoconjunctivitis (IBK) affecting half of a group of 20. *Moraxella bovoculi* was isolated from two, and *Moraxella bovis* from the third, with both organisms considered potentially significant. *Trueperella pyogenes* was also cultured in one case and will have been contributing to the disease process as a secondary infection. Both *Moraxella* species can be isolated from healthy eyes and while *M. bovis* has been proven to cause IBK following experimental infection the same is not true for *M. bovoculi*. *M. bovis* secretes damaging toxins and enzymes and possesses pili that allow it to attach to the cornea. A small number of equivalent virulence factors have been confirmed in *M. bovoculi*, but it has significantly different pili and strains vary in their pathogenicity. Whole genome sequencing has shown that *M. bovis* and *M. bovoculi* can undergo genetic recombination with each other.

Reference:
Loy JD, Hille M, Maier G, Clawson ML. Component causes of infectious bovine keratoconjunctivitis – the role of Moraxella species in the epidemiology of infectious bovine keratoconjunctivitis. Vet Clin North Am Food Anim Pract 2021; 37:279– 93.

Skin disease

Udder cleft dermatitis investigation

A farm visit was carried out to investigate ongoing issues with Udder Cleft Dermatitis (UCD) in a dairy herd. The farm has experienced ongoing issues with UCD, which was affecting approximately 10% of the 235-cow dairy herd at any one time, and for approximately five years. The farmer had attempted multiple topical treatments throughout the years, none of which appeared to improve lesions. Samples were collected from four cows (under the APHA Cattle Group UCD project), as well as photographs of lesions and udder conformation.

Following the visit, the farm was advised to continue to review potential risk factors and to increase monitoring of the udders and udder clefts for early lesions (potentially by using a mirror on a stick to increase visibility). A UCD working group is discussing the findings from different farms and different research strands. The use of histopathological examination of skin biopsies from lesions to aid investigation is also being considered by the group.

Circulatory and lymphatic system diseases

Lymphomatoid Granulomatosis in a dairy heifer

An unusual neoplasm was detected in the lung tissue of a one-year-old dairy heifer, which had had a history of ill-thrift. The herd had a history of pneumonia. An on-farm postmortem examination of the heifer was unremarkable, except for a small abscess within the caudal lung lobes and congestion of the right cranial lung lobe. Testing for common respiratory pathogens only detected a few colonies of *Bacillus licheniformis*. Histological examination, however, found cellular infiltration of the interstitial spaces around vessels and airways of the lung.

The histomorphology in this case, in particular the predilection for cuffing vessels, resembled Lymphomatoid Granulomatosis (LG), a lymphoproliferative disorder recognized in humans and dogs. In humans, LG is associated with Epstein-Barr virus infection and is considered to be a B cell tumour with a prominent T cell infiltrate. The aetiopathogenesis and immunophenotype of LG in dogs is less well understood. In cattle, infection with bovine leukosis virus produces a B cell leukaemia or lymphoma. The mixed immunophenotype of the infiltrating cells here and the age of the animal further militated against this being a case of EBL. It is highly likely that similar changes would have been present in other organs, although these were not available.

Reproductive system – Abortion, Stillbirth, and Congenital Deformities

The most frequent diagnoses from abortion and stillbirth submissions made in the second quarter (Q2) of 2024, compared to Q2 in 2023, and Q2 for 2015 to 2024 inclusive, through the Great Britain (England, Wales, and Scotland) scanning surveillance network, are illustrated in Table 3. These can be interrogated further using the interactive cattle disease surveillance dashboard which was launched in October 2017.

Table 3: Great Britain scanning surveillance 10 most frequent abortion and stillbirth submission diagnoses in Q2 of 2024, Q2 of 2023, and Q2 for 2015-2024

10 most frequent abortion diagnoses Q1 2024	10 most frequent abortion diagnoses Q1 2023	10 most frequent abortion diagnoses Q1 2015-2024
1. Fetopathy due to Schmallenberg virus	1. Fetopathy diagnosis not listed	1. Fetopathy diagnosis not listed

2. Fetopathy or stillbirth due to congenital abnormality	2. Fetopathy due to *Neospora* infection	2. Fetopathy due to *Neospora* infection
3. Fetopathy due to *Bacillus licheniformis*	3. Fetopathy or stillbirth due to congenital abnormality	3. Fetopathy due to *Bacillus licheniformis*
4. Fetopathy due to *Salmonella* Dublin	4. Fetopathy due to *Trueperella pyogenes*	4. Fetopathy due to *Trueperella pyogenes*
5. Fetopathy due to *Trueperella pyogenes*	5. Fetopathy due to *Bacillus licheniformis*	5. Fetopathy or stillbirth due to congenital abnormality
6. Fetopathy diagnosis not listed	6. Fetopathy due to *Salmonella* Dublin	6. Stillbirth due to dystocia
7. Fetopathy due to *Neospora* infection	7. Stillbirth due to bradytocia	7. Fetopathy due to *Salmonella* Dublin
8. Stillbirth due to anoxia otherwise unexplained	8 Fetopathy due to Listeria sp	8. Fetopathy due to Listeria sp
9. Fetopathy due to fungi	9. Fetopathy due to traumatocia	9. Fetopathy with BVD detected in the fetus
10. Stillbirth due to bradytocia	10. Fetopathy due to Q fever	10. Fetopathy due to fungi

Abortion due to *Trueperella pyogenes*

A fetus and placenta were submitted to investigate the cause of two abortions in a dairy herd milking 160 cows. The placenta was reddened and thickened, suggesting a placentitis. *Trueperella pyogenes* was cultured in pure growth from fetal stomach contents. Histopathology confirmed placentitis and suppurative bronchopneumonia in the fetus, with large numbers of coccobacillary bacteria present. Abortion due to *Trueperella pyogenes* is usually sporadic and, can be associated with a septic focus elsewhere in the dam.

Figure 10: Reddening and thickening of a bovine placenta from an abortion due to *Truperella pyogenes*

Congenital thyroid follicular hyperplasia (goitre) in a stillborn calf

Congenital thyroid follicular hyperplasia was identified in a stillborn calf submitted to investigate two stillbirths from a group of Holstein-Friesian dairy heifers. The heifers were tissue tested for BVD and vaccinated with a BVD vaccine prior to mating. Over the winter, the heifers had been fed on a mixture of silage and hay, with concentrates being supplemented only in the last few weeks of gestation. On postmortem examination, no gross abnormalities were noted other than an obvious goitre and a thyroid gland with a weight of 62.5g, constituting 0.125% of bodyweight. No infectious aetiology was established through routine testing and histopathology confirmed follicular hyperplasia.

Advice was given on potential causes of goitre, which included iodine deficiency, iodine excess, exposure to goitrogenic compounds, and genetic defects in thyroid hormone synthesis (considered less likely with no recognised heritable trait recorded in Holstein-Friesians). Further investigations into these risk factors were warranted on-farm.

Syndactyly in a Limousin calf

A purebred Limousin calf, which had been born alive, was euthanased and submitted for postmortem examination to investigate the cause of limb deformities. It was reported that a similarly affected calf had been aborted in the herd of 60 cows in November, and the practitioner tested for Schmallenberg virus, BVDv, *Neospora caninum*, bacterial and fungal infections, with none identified. Postmortem examination of the euthanased calf confirmed that each limb was shortened and had a single fused digit (Figure 11), rather than the normal paired digits of ruminants. This malformation is known as ‘syndactyly’, which some refer to as 'mulefoot'. Syndactyly has been identified as an inherited autosomal recessive trait with variable penetrance in different cattle breeds (Holstein, Angus, Simmental, Angus, Chianina, Hereford, German Red Pied, Indian Hariana, and Japanese native cattle: Drögemüller and others 2007). It has not previously been recognised in Limousins although a similarly affected calf was also recently reported by our colleagues in SRUC. Collaborative work with SRUC and Swiss colleagues in the University of Bern is planned to investigate further whether there is a genetic cause, and blood samples from the dams of affected calves, and if available, the sire, together with tissue samples from the affected calves, will be forwarded to Switzerland for genetic analysis.

Reference

Drögemüller C, Leeb t, Harlizius B, Tammen I, Distl O, Höltershinken M, Gentile A, Duchesne A, Eggen A. Congenital syndactyly in cattle: four novel mutations in the low density lipoprotein receptor-related protein 4 gene (*LRP4*). BMC Genetics 2007;8:5

Congenital syndactyly in cattle: four novel mutations in the low density lipoprotein receptor-related protein 4 gene (LRP4) - PMC (nih.gov)

Figure 11: Syndactyly in a Limousin calf

Mastitis

There were 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 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

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

Toxic conditions

Botulism in a suckler herd

An outbreak of suspected botulism occurred in a group of 30 suckler cows and 30 calves. The animals had been moved from the farm where they had calved to a rape stubble field and, had been on this field for three weeks before the problem started. A week before the problem started, chicken litter had been spread on the fields that they were grazing. The first case was found recumbent and hypothermic in a ditch but later died. The second calf, which had also fallen down a ditch, was helped onto its feed but was very weak and later died. Over the following week, four more calves presented with weakness and were unable to stand, and a cow presented with a staggering gait. All these cases died or required euthanasia. There was no permanent response to treatment including vitamin E and selenium injections and magnesium. Overall, six calves and one cow were clinically affected and died. The group were moved off the rape stubble field the day after the outbreak started but clinical signs continued to occur over the following 4 days. Two 6-week-old calves were examined postmortem. There were no significant gross or histological findings. Testing revealed no significant bacteria on culture, no elevation in lead levels above background, and no evidence of myopathy. Clostridium botulinum toxin C and D ELISA performed on the small intestinal content of both gave a negative result. Given the clinical findings and exposure to poultry litter, the absence of an alternative diagnosis, and the extreme sensitivity of cattle to botulinum toxin, botulism was considered the most likely cause of these deaths. A voluntary restriction was placed on the group for 2 weeks after the last clinical case occurred. Food Standards Scotland were notified of this suspected case.

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.

Bluetongue virus (BTV) in Europe: Bluetongue virus in Europe - GOV.UK (www.gov.uk)

Epizootic Haemorrhagic Disease (EHD): Epizootic haemorrhagic disease in Europe - GOV.UK (www.gov.uk)

Influenza A (H5N1) of avian origin in domestic livestock in the USA: Influenza A (H5N1) of avian origin in domestic livestock in the USA - GOV.UK (www.gov.uk)

Lumpy skin disease in North Africa and East Asia: Lumpy skin disease in North Africa and East Asia - GOV.UK (www.gov.uk)

Epizootic Haemorrhagic Disease

Epizootic haemorrhagic disease (EHD) is caused by EHD virus, which is an Orbivirus very closely related to BTV. Like BTV it is spread by *Culicoides* spp. and potentially germplasm, and causes a vascular disease resulting in haemorrhages, mucosal ulceration, and pulmonary oedema. As a result, it is clinically indistinguishable from BTV. Unlike BTV, EHD has a predilection for deer, causing a high mortality rate in particularly susceptible species, but it can also cause fatal disease in cattle. Small ruminants and camelids tend to be subclinically infected, and probably act as a reservoir for infection.

EHD is notifiable. It is present on all continents except Antartica, but its first incursion into Europe was only in October 2022 when it spread north across the Mediterranean basin. In

September 2023 it spread into France and by 28th November, 3527 outbreaks had been reported in Southern France. Models predict it will spread further north into Scandinavia.

Clinical signs include hyperaemia of the mucous membranes, oral ulceration, crusting around the nostrils, respiratory distress, lameness, congestion of the coronary bands, erythema and ulcers on the udder.

Epizootic Hemorrhagic Disease Virus: Current Knowledge and Emerging Perspectives - PubMed (nih.gov)

Publications of interest

APHA Surveillance Reports

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)

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)

SRUC-VS Surveillance Reports

April: Mycotoxicosis suspected as a cause of abortion in a sow - 2024 - Veterinary Record - Wiley Online Library

May: Staphylococcus aureus causing respiratory disease and mastitis in sheep - 2024 - Veterinary Record - Wiley Online Library

June: Tickborne disease contributing to lamb deaths across Scotland - 2024 - Veterinary Record - Wiley Online Library

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.