

SRUC VS Surveillance Activities – Quarterly Report

January to March 2022

SRUC Veterinary Services (VS) carries out animal disease surveillance activities on behalf of Scottish Government. These include regular communications to veterinary practices on a range of animal health matters and responding to requests for expert advice and support in relation to disease investigations as well as provision of a necropsy and clinical pathology service.

Stakeholder contact and outreach

From 1st January to 31st March SRUC VS recorded a total of 135 contacts, 118 of which were with 47 Scottish vet practices. We recorded a further 17 calls and emails from a range of national bodies and vet practices in England. Over 93% of queries (126) related to the main livestock species cattle and sheep; the remaining calls concerned camelids, birds, farmed deer, pigs and fish. Over 90 percent (124) of recorded contacts were by phone.

Most requests (123 of 135) involved support with disease investigations. Of the 74 clinical issues in cattle discussed with practitioners, diarrhoea, respiratory disease and malaise in live animals were the most common topics. When compared to phone contacts in 2021, VS SRUC saw far fewer enquiries regarding abortions yet there was a relative increase in reported enteritis and malaise cases (Figure 1). Whilst no particular cause was identified for the rise in enteritis cases, historic data showed that SRUC VS had received far fewer samples from adult enteritis cases in the winters 2019/2020 and 2020/2021. The increase last winter may therefore be explained by a return to normal following two unusual winters.

For the 50 recorded contacts concerning sheep, abortion, wasting and sudden death were the most commonly discussed clinical findings. Compared to the same period last year, wasting was more often discussed than sudden deaths (Figure 2). In the same time period more cases of OPA and Johne's disease were diagnosed in ovine submissions, which may have been connected to these calls.

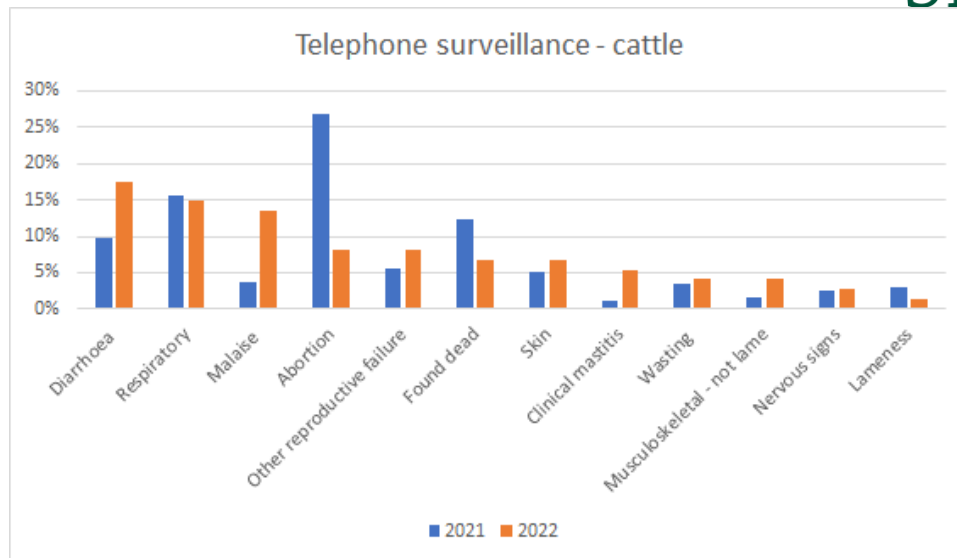


Figure 1: The 12 most common presenting signs in cattle discussed during 74 contacts, mostly by telephone with practicing vets from 1st January to 31st March 2022. Compared to 2021, proportionally more cases of diarrhoea and malaise, whereas fewer abortions were reported.

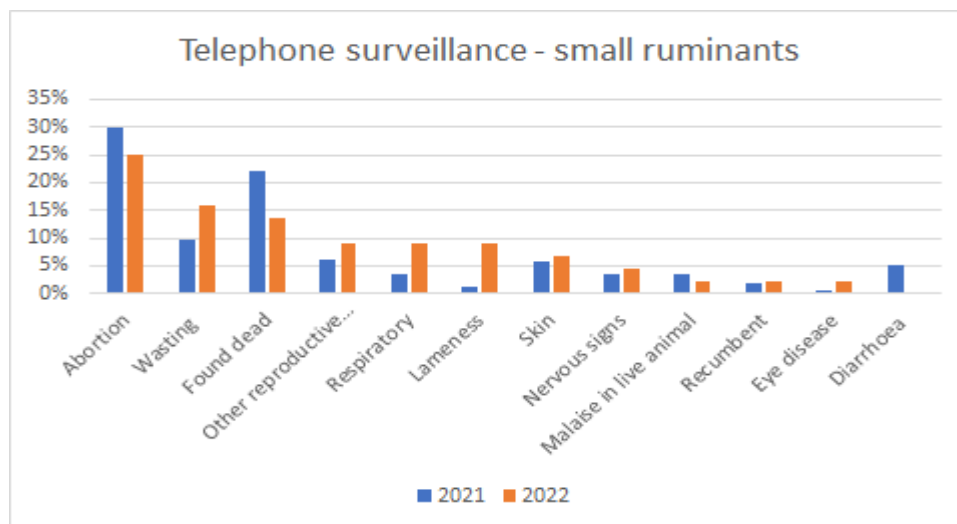


Figure 2: The 12 most common presenting signs in sheep discussed during 50 contacts, mostly by telephone with practicing vets from 1st January to 31st March 2022.

Submissions and diagnostic rates

Abortion and postmortem (PM) material are handled by our network of PM centres throughout Scotland, while clinical pathology samples and material arising from carcass examinations by private veterinary surgeons (PVS) are submitted to our veterinary and analytical laboratory near Edinburgh.

2,837 laboratory submissions were received from 105 vet practices in the SRUC VS catchment area. In the last quarter this included 91 practices based in Scotland and 14 practices in Cumbria and Northumberland, which carry out work on both sides of the border. Further diagnostic samples were submitted from industry bodies (QMS), universities, law enforcement bodies (Police Scotland and SSPCA) as well as the International Otter Survival Fund.

SRUC VS received 1,892 diagnostic submissions (disease investigation) and 945 monitoring submissions (screening of healthy animals).

The most common clinical presentations for diagnostic submissions across all main livestock species were abortions followed by wasting, diarrhoea and sudden death. Differences in presenting signs for cattle and small ruminants are shown in Figures 3 and 4.

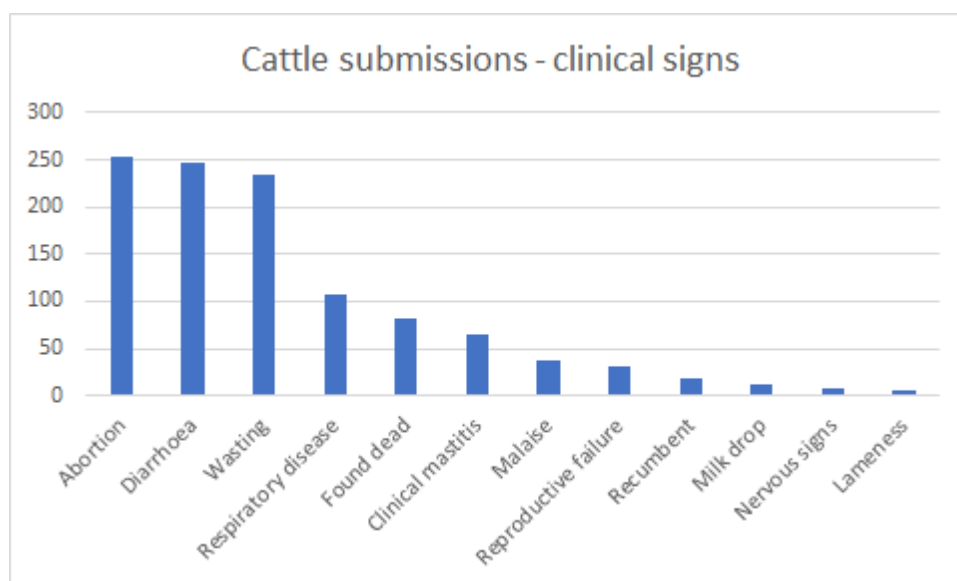


Figure 3: The 12 most common clinical signs of 1,122 diagnostic submissions received from cattle during the first quarter of 2022.

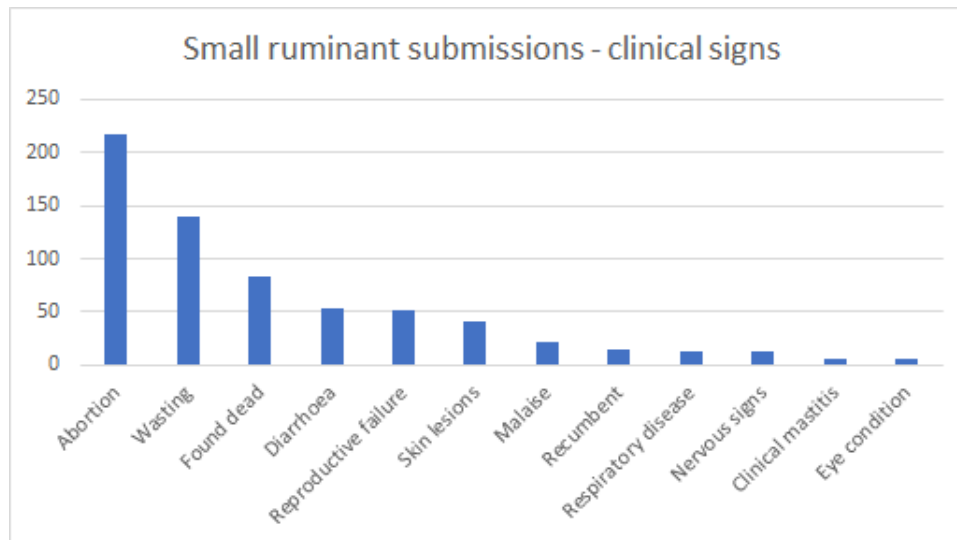


Figure 4: The 12 most common clinical signs of 678 ovine and caprine diagnostic submissions received from 1st January to 31st March 2022.

The clinical syndromes discussed with practitioners (Fig 1 and 2) and those investigated by diagnostic submissions (Fig 3 and 4) included a similar set of presenting signs. For sheep, the three presenting signs discussed and investigated the most frequently were abortion, wasting and found dead. For cattle the discussed and investigated clinical conditions varied more. Diarrhoea was often discussed and investigated. On the other hand, respiratory disease was more often subject of a discussion than a lab submission. Conversely, we received proportionally more submissions to investigate abortions and wasting than we discussed these syndromes with practitioners.

Submissions by species groups

VS receive submissions from livestock species, mainly cattle and sheep, poultry, pigs and camelids as well as native wildlife and companion animals, though the last group is not covered in this report. Clinical pathology submissions, e.g., blood and faeces make up the bulk of submissions. Sixty percent of samples were submitted from cattle and 35 percent from small ruminants, respectively.

We further received samples from native wildlife, pigs, camelids, birds, and other species (5, not included in table 1). Carcase submissions came mainly from small ruminants, mainly sheep (117) and cattle (97).

	Birds	Camelids	Cattle	Native wildlife	Pigs	Small ruminants
No. of submissions	8	25	1702	52	42	1003

Table 1: Submission count by species groups received in quarter Jan to Mar 2022. The total of 2,837 includes monitoring (healthy animals) and diagnostic submissions, including submissions under the wild bird surveillance scheme.

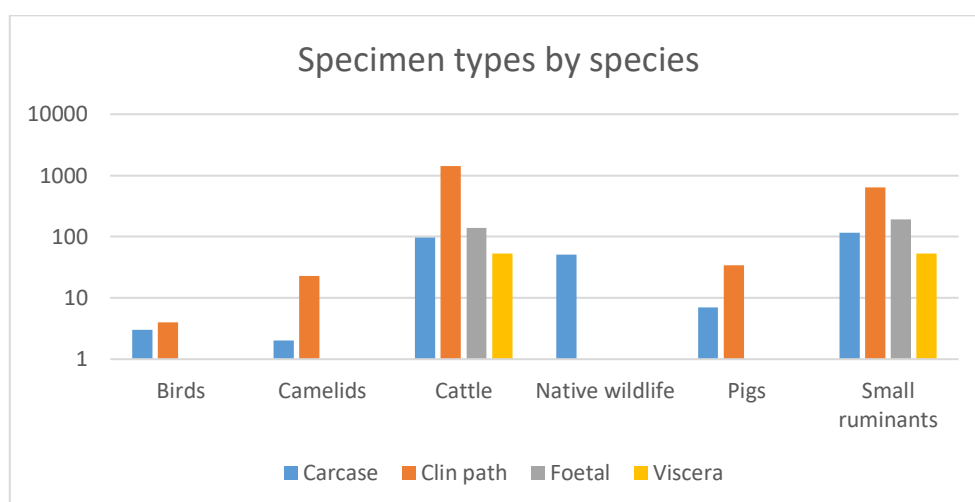


Figure 5: Submissions received from Jan to Mar 2022 by species groups and specimen, please note the logarithmic scale for the submission count.

Diagnostic rates

Diagnostic rates in last quarter are shown below for carcasses examined by SRUC VIOs (carcase); clinical pathology submissions i.e. mainly blood and faeces (clin path); abortion investigations by SRUC VIOs (foetal); submissions of viscera from PM and abortion examinations by vets in practice (viscera).

	Diagnosis reached	Diagnosis not reached	Total	Percentage
Carcase	236	32	268	88%
Clin path	418	777	1195	35%
Foetal	126	204	330	38%
Viscera	58	41	99	59%

Table 2: Comparison of 1,892 diagnostic submissions by specimen type for which a diagnosis was reached (DR) and no diagnosis was reached (DNR), respectively.

Most diagnoses were reached on clinical pathology submissions, whilst PM examination (PME) offered the highest chance to reach a diagnosis. PMEs and clinical pathology investigations don't necessarily aim for the same goal. Samples taken from live animals are not always tested to reach a diagnosis but to exclude specific differential diagnoses,

explore previous exposure to certain pathogens to narrow down likely diagnoses or to determine the severity of the clinical state to inform prognosis. On the other hand, PME's offer more ways of diagnostic investigation and are conducted with the clear goal to reach a diagnosis, this gives the added benefit of screening for exotic and re-emerging diseases. The diagnostic rate consequently is lower in clin path submissions. To take full advantage of the diagnostic possibilities PME's are subsidised.

Diagnosis	2022	Q1	Median	Q3
Johne's disease	109	100	154	205
Cryptosporidiosis	37	36	57	86
Mastitis dt <i>E. coli</i>	25	20	23	30
Pneumonia dt <i>Mycoplasma bovis</i>	24	3	8	13
Fasciolosis	23	35	68	108
Rotavirus disease	20	20	43	73
Mastitis dt <i>Streptococcus uberis</i>	14	13	24	34
Coccidiosis	13	4	8	16
Hypogammaglobulinaemia	10	21	32	41
Pneumonia dt <i>Pasteurella multocida</i>	10	11	13	18

Table 3: Most commonly diagnosed conditions in cattle in first quarter of 2022. For comparison, first (Q1), second (median) and third quartile (Q3) are given for diagnoses reached in sheep from 2007 to 2021 in the first quarter of the respective years. In this example describing a distribution over 15 years, Q1 denotes the 4th, Q2 the 8th and Q3 the 12th highest value over the entire time period.

Diagnosis	2022	Q1	Median	Q3
Parasitic gastroenteritis	40	35	46	52
OPA (Jaagsiekte)	27	11	16	21
Fetopathy dt <i>Toxoplasma</i>	23	23	29	38
Fetopathy dt <i>Chlamydia abortus</i>	23	40	45	60
Johne's disease	22	12	17	18
Coccidiosis	13	3	4	8
Chronic fasciolosis	12	31	55	88
Pneumonia dt <i>Mannheimia spp</i>	11	9	14	16
<i>Listeria</i> encephalitis	10	9	11	16
Hyposelenaemia/Hyposelenosis	9	4	6	10

Table 4: Most commonly diagnosed conditions in small ruminants in first quarter of 2022. For comparison, first (Q1), second (median) and third quartile (Q3) are given for diagnoses reached in sheep from 2007 to 2021 in the first quarter of the respective years. In this example describing a distribution over 15 years, Q1 denotes the 4th, Q2 the 8th and Q3 the 12th highest value over the entire time period.

Species	Diagnosis	Count
Birds	Egg peritonitis/salpingitis complex	1
Birds	Helminthosis	1
Camelids	Fasciolosis	1
Camelids	Parasitic gastroenteritis	1
Native wildlife	Avian influenza	30
Native wildlife	Trauma and predation	9
Pigs	Proliferative enteropathy	4
Pigs	Haemophilus parasuis (Glässer's disease)	2

Table 5: Most commonly diagnosed conditions in birds, camelids, native wildlife and pigs in first quarter of 2022. These diagnoses were reached based on both PM and clinical pathology submissions.

Selected cases from the Quarter

Cattle

Two further cases of ***E coli meningitis*** in calves older than one month of age were identified, one in a weaned suckler calf and one in dairy bred calves on separate holdings. These build on the case series investigated and reported so far and **Whole Genome Sequencing** of the isolates is in progress to look for strain types and virulence factors. This presentation represents a change from the conventional norm of this being a neonatal condition.

Two cases of **ill thrift, diarrhoea** and subsequent mortality in adult **sucker cows** were investigated on separate holdings with the diagnosis of plasmacytic enteritis. The clinical presentation and gross pathology were suggestive of Johne's disease or chronic fasciolosis. Although in both cases the histopathological diagnosis was clear the **primary cause could not be determined** and auto-immune or aberrant response to parasitism or other enteropathogen remain possibilities.

The number of diagnoses of ***Mycoplasma bovis*** as part of the respiratory disease complex increased. This may in part be due to an increased **awareness** of the condition and better diagnostics, along with a genuine increase in incidence.

Increased numbers of **telephone reports** for outbreaks of '**winter dysentery syndrome**' in dairy herds were received. This syndrome is less likely to be identified through laboratory testing or post-mortem diagnosis. Where diagnostics were used bovine coronavirus was detected in some cases although the relative significance of this pathogen and potentially other pathogens as part of the syndrome is not fully understood.

Small Ruminants

Schmallenberg virus was detected only once on PCR testing of brain tissue from a single submission from a small flock lambing in late January. Seven of ten ewes lambed and three gave birth to one lamb with **arthrogryposis**. Two of these ewes and one barren ewe tested seropositive for Schmallenberg antibody. The ewe had been purchased in 2021 but had been in north-east Scotland from conception until parturition. This confirms viral transmission by SBV infected midges in this location during autumn. Free testing was made available but no further cases of foetopathy or congenital deformity due to Schmallenberg virus infection were diagnosed.

BVD virus was detected on PCR testing of foetal spleen following abortion in a Dutch spotted ewe. Further typing at the Moredun Research Institute confirmed it to be BVDV type 1a. Sequencing suggested that it was likely to have **originated from cattle**, rather than from circulation in sheep, as it was highly homologous to BVDV isolates from cattle. No breeding cattle were present on the farm and the sheep had no direct contact with cattle. The most likely source of virus was considered to be batches of store cattle that were purchased and housed until finished. Transmission via fomites was suggested as the route of cross species infection in this case.

Pigs

PRRS outbreak in a commercial boar stud in Yorkshire caused intensified testing of other herds further down the supply chain.

Rotavirus enteritis and *Clostridium difficile* enterocolitis have been diagnosed on several occasions in neonatal piglets with diarrhoea. Occasionally in conjunction with failure of passive transfer.

Herpes-associated inclusion body rhinitis with secondary exudative bacterial-type rhinitis was diagnosed as a cause of sneezing and ill-thrift in a 3.5 -week-old Duroc-cross piglet.