

Regional Veterinary Laboratories Report

February 2022

Regional Veterinary Laboratories (RVLs) carried out necropsy examinations on 436 carcasses and 321 fetuses during February 2022. Additionally, 2,070 diagnostic samples were tested to assist private veterinary practitioners with the diagnosis and control of disease in food producing animals. This report describes a selection of cases investigated by the Department of Agriculture, Food and the Marine's (DAFM) veterinary laboratories in February 2022.

The objective of this report is to provide feedback to veterinary practitioners on the pattern of disease syndromes at this time of the year by describing common and highlighting unusual cases. Moreover, we aim to assist with future diagnoses, encourage thorough investigations of clinical cases, highlight available laboratory diagnostic tools and provide a better context for practitioners when interpreting laboratory reports.

CATTLE

Pneumonia and enteritis were the most common diagnoses from necropsy in cattle in the RVLs during February 2022.

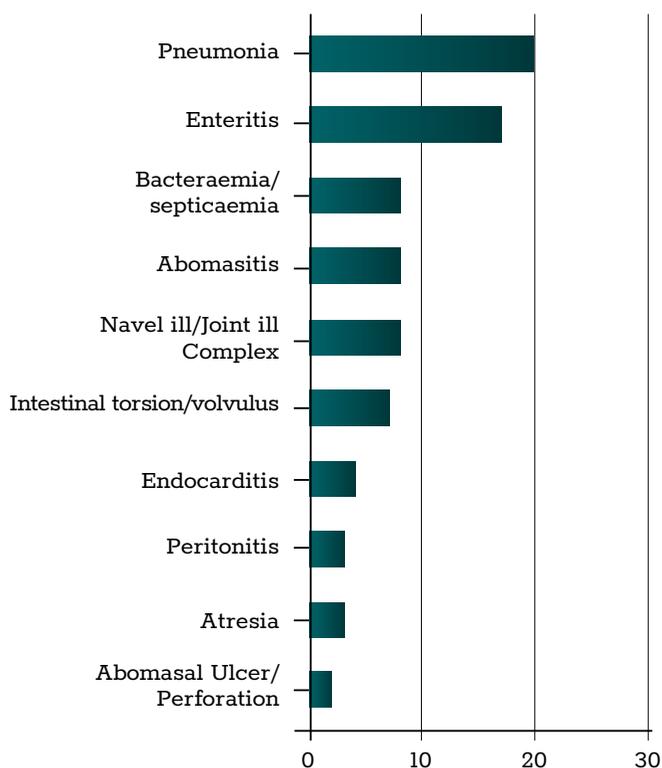


Table 1: The most common diagnoses in cattle submitted for necropsy in February 2022.

GASTROINTESTINAL TRACT

Abomasitis and abomasal perforation

Athlone RVL examined a ten-day-old dairy calf with a history of abdominal distension followed by death. There were three other similar losses in the group. On necropsy, the abomasum was markedly distended with a severe, diffuse, oedematous, emphysematous abomasitis. Abomasal contents were liquid and dark red in colour. There was a small abomasal perforation approximately 2-3mm in diameter near the fundus with leakage of abomasal contents into the peritoneal cavity, and a mild fibrinous peritonitis. Intestinal contents were liquid.

Histopathology of the abomasum revealed a severe, diffuse, acute, suppurative abomasitis with *Sarcina sp.* bacteria observed. A diagnosis of abomasitis with secondary peritonitis was made.

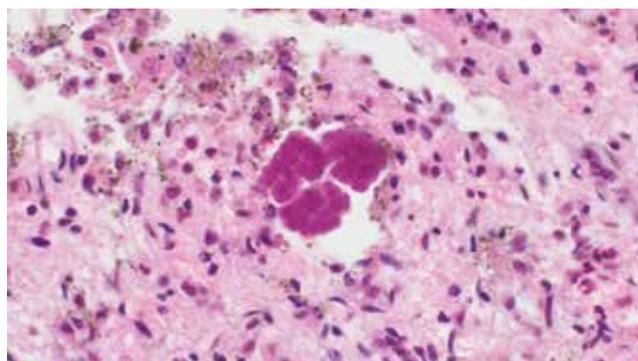


Figure 1: *Sarcina sp.* in their typical cuboidal tetrad structure observed in a case of abomasitis in a calf. Photo: Sarah Delaney.

Sarcina sp. and Abomasitis

Sarcina species indicate abnormal abomasal bacterial flora. *Sarcina sp.* proliferate when there is an excess of fermentable carbohydrate within the abomasum. This could result if a degree of tympany develops following ingestion of a large volume of milk. *Sarcina species* ferment sugars, producing carbon dioxide, which can exacerbate tympany, potentially reducing mucosal perfusion. Other products of fermentation such as acetate, hydrogen and ethanol can cause chemical damage to the mucosa and may reduce the pH, which further slows abomasal emptying. It is hypothesised that a repeated cycle of mucosal damage triggered by large intakes of milk may predispose to abomasal ulceration and perforation.

Johne's disease

A two-year-old bullock was submitted to Limerick RVL from a 70-cow dairy herd with an associated calf-to-beef system, with a history of diarrhoea for almost one year. It had improved during the summer months but relapsed and lost a lot of condition. It had been treated on multiple occasions without success. This was the third animal to die on the holding with similar clinical signs over a three-year period. Necropsy found poor body condition, and watery rumen and

abomasal contents. The lower small intestine and caecum were inflamed and thickened, with a corrugated appearance to the mucosa (photo). The intestinal contents were very watery in consistency. An enzyme-linked immunosorbent assay (ELISA) for Johne's disease on a blood sample from this animal returned a positive result, and *Mycobacterium avium* subspecies *paratuberculosis* (MAP), the causative organism of Johne's disease, was detected by culture.



Figure 2: Inflamed and corrugated intestinal mucosa in a case of Johne's disease in a two-year-old bullock. Photo: Alan Johnson.

Neonatal enteritis testing

Cryptosporidium parvum and rotavirus were the most commonly isolated enteric pathogens in neonatal calves in February 2022. This finding is in line with those in this age group in previous years.

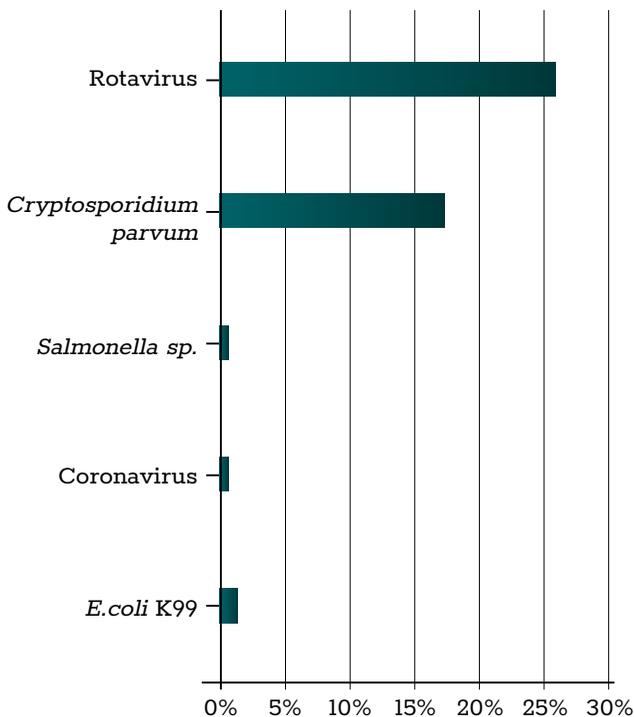


Table 2: Pathogens detected in cases of neonatal enteritis in February 2022.

RESPIRATORY TRACT

Pericarditis and pleuropneumonia

Athlone RVL examined a two-week-old calf with a history of respiratory signs. On necropsy, there was a marked, diffuse, fibrinous pericarditis and a marked, diffuse, fibrinous pleuritis. There was cranioventral congestion and consolidation of approximately 20 per cent of lung parenchyma. *Mannheimia haemolytica* was isolated on culture, and also was detected on polymerase chain reaction (PCR) examination of lung tissue. Histopathological examination revealed a severe, diffuse, fibrinosuppurative pleuritis with streaming 'oat cells' and intra-lesional bacterial colonies, and a moderate, multifocal, fibrinosuppurative bronchopneumonia. A diagnosis of pericarditis and pleuropneumonia caused by *M. haemolytica* was made.



Figure 3: Pericarditis and pleuropneumonia due to *Mannheimia haemolytica* in a calf. Photo: Sarah Delaney.

Athlone RVL examined a five-year-old Friesian cow that had presented clinically with respiratory signs, was treated, didn't respond and died. It was the second similar case within a few days. Body condition was very poor with a bodyweight of 390kg. On post-mortem examination, there was a severe, bilateral, cranioventral, fibrinous pleuritis and extensive cranioventral lung discolouration and consolidation; the affected lungs were dark and friable, with marked interlobular oedema and fibrinous pleurisy. The liver was pale and slightly jaundiced and there was very poor rumen fill. *M. haemolytica* was isolated from the lungs by culture and detected on PCR. Histopathology of the lungs showed a diffuse, fibrinosuppurative bronchopneumonia with streaming "oat cells" typical of a *Pasteurella*-type pneumonia. A conclusion of bronchopneumonia caused by *M. haemolytica* was reported. Similar reports of fatal pneumonia caused by *M. haemolytica* in dairy cows have been reported in the Netherlands and in the UK. Stress induced by management, such as transport or feed change, or physiological stress induced by high production, climate, or unidentified microbial agents, could increase *M. haemolytica* replication resulting in inhalation of bacterial-laden droplets into the lungs.

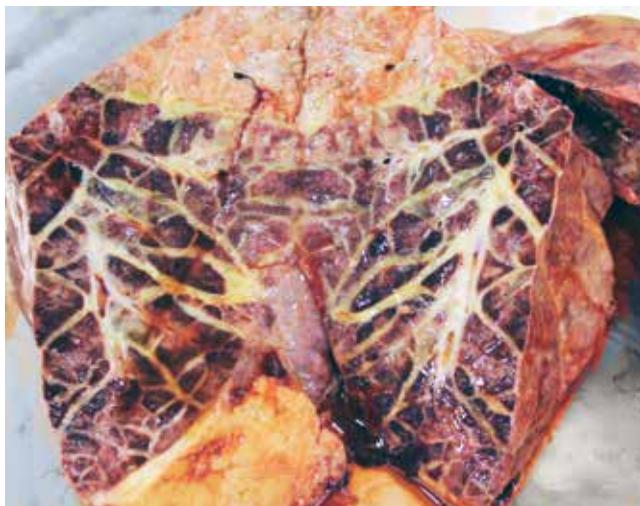


Figure 4: Pneumonia and marked interlobular oedema due to *Mannheimia haemolytica* infection in a cow. Photo: Denise Murphy.

A pair of two-week-old calves died and were submitted to Kilkenny RVL; no signs were observed prior to death. Findings were similar in both calves; there was fibrinous pneumonia and pleuritis with approximately 60 per cent of lung tissue consolidated. There was 'rice grain' abscessation within the consolidated regions. There was little to no milk evident in the abomasum of either. *Pasteurella multocida* was cultured and positive PCR results were obtained for *Mycoplasma bovis*, *Histophilus somni* and bovine corona virus (BoCo). A zinc sulphate turbidity test (ZST) showed adequate colostral immunity in one calf, the other showed failure of passive transfer. The immune status of the animal is important in the development of pneumonia; failure of passive transfer is a risk for the increased severity of respiratory disease in calves. With pneumonic pathogens, non-specific respiratory defences can be compromised by many risk factors, such as viral pathogens, changes in temperature, cold stress, overcrowding, transport, poor air quality and poor nutrition – all predisposing to pneumonia. A review of pneumonia control and colostrum management was recommended. Furthermore, the farmer was advised not to feed waste milk to calves.



Figure 5: Cranioventral distribution of pneumonia in a calf. Photo: Aideen Kennedy.

URINARY/REPRODUCTIVE TRACT

Nephritis and polyarthritis

A five-week-old calf was presented to Kilkenny RVL with a history of unexpected death; it had been observed drinking the morning it was found dead. On gross examination, the perineal area was alopecic and there was an umbilical infection and a pale, white-spotted kidney and evidence of septic arthritis in two joints. There was also suspected hypopyon (inflammatory cells [pus] in the anterior chamber of the eye). These findings are suggestive of a bacteraemia/septicaemia. The hair loss in the perineal area may be associated with previous diarrhoea. A close examination of cohorts and a review of calving hygiene was recommended.

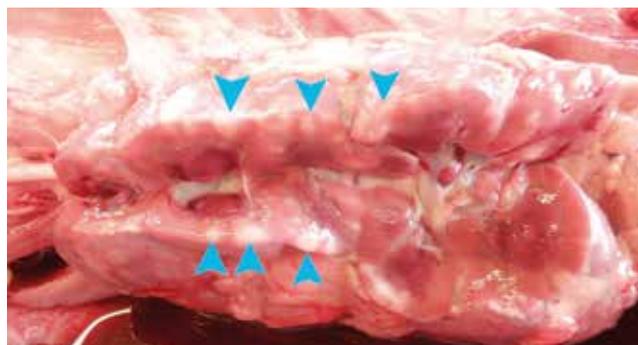


Figure 6: White-spot lesions in the kidney of a calf, one of a number of lesions suggestive of bacteraemia/septicaemia. Photo: Maresa Sheehan.

Congenital mesothelioma

Athlone RVL examined a full-term bovine foetus with a history of apparent deformity. On gross post-mortem examination, the abdomen was distended with fluid and there was subcutaneous haemorrhage and oedema of the hindlimbs and scrotal sac. The abdomen was full of bloody fluid and the carcass and liver were pale. There was a large soft lobulated and haemorrhagic mass of very friable and occasionally necrotic material in the caudal abdomen/pelvic area which broke up on handling. Histopathology of the lesion concluded it was a congenital mesothelioma. These tumours were almost exclusively found in the abdominal cavity. They are usually accompanied by large amounts of fluid which in some foetuses and neonates cause dystocia.



Figure 7: A haemorrhagic mass in the abdomen of a stillborn calf, determined to be a congenital mesothelioma. Photo: Denise Murphy.

CARDIOVASCULAR SYSTEM

Vegetative endocarditis and pulmonary embolism

A ten-month-old weanling with suspect pneumonia was submitted to Kilkenny RVL, having failed to respond to antibiotics. On examination, the weanling was very dehydrated. There was an increased volume of fluid in the thoracic cavity. Examination of the heart showed a vegetative endocarditis on the right atrio-ventricular (AV) valve. There was also a mild pericarditis. There was a multifocal embolic pneumonia with yellow colour to the emboli. The remainder of the lungs were heavy, oedematous and congested. There was a wet glistening appearance to the viscera. A diagnosis of vegetative endocarditis and embolic pneumonia was made. *Streptococcus dysgalactiae* was cultured from multiple organs suggesting a bacteraemia. Several different species are susceptible to infection by *S. dysgalactiae*, but bovine mastitis and infectious arthritis in lambs have been most frequently reported.



Figure 8: Vegetative endocarditis (top left) on a weanling's atrio-ventricular cardiac valve. Photo: Aideen Kennedy.

Athlone RVL examined an eight-year-old cow with a history of lethargy, inappetence, diarrhoea and irregular heart rhythm. There was no response to treatment, and she was euthanised. There were no other similar losses in the herd. On gross post-mortem examination, the heart was markedly enlarged. There were multifocal, nodular, friable, yellow/grey lesions present on the pulmonary heart valve, with involvement of the tricuspid (right AV) valve also. There was a mild, multifocal, fibrinous pericarditis and multifocal randomly distributed abscessation of lung parenchyma. The liver was enlarged with a diffuse nutmeg pattern. There was marked ascites with diffuse oedema of the mesentery, intestines and abomasal folds. *Escherichia coli* was isolated from the heart lesion. A diagnosis of vegetative endocarditis was made. Athlone RVL examined a ten-month-old weanling with a history of dullness one week prior to death; it was treated with antibiotics by the vet and seemed to respond well, before being found dead unexpectedly. There was a severe, diffuse, fibrinous pericarditis, with fibrinous adhesions between the pericardial sac and the epicardium. Heart valves were

unaffected. There was diffuse pulmonary congestion and oedema, and localised fibrinous pleural adhesions in the left middle and caudal lung lobes. There was a nutmeg pattern in the liver characteristic of hepatic congestion. A diagnosis of chronic, constrictive pericarditis resulting in congestive heart failure was made. In cattle, pericarditis is almost always attributable to a reticular foreign body that has penetrated the reticular wall, diaphragm and pericardial sac. A foreign body was not identified in this case, but the lesions were chronic in nature.



Figure 9: Fibrinous pericarditis in a weanling that appeared chronic in nature, leading to congestive heart failure. Photo: Denise Murphy.

MISCELLANEOUS

Sporadic bovine leucosis

An 11-month-old weanling was submitted to Kilkenny RVL having received treatment for vague respiratory signs, to which it failed to respond. Petechial haemorrhages were found on the epicardium at necropsy. There was massive enlargement of the spleen and enlargement of lymph nodes. No significant bacterial pathogens were isolated on routine culture. A diagnosis of lymphoma/lymphosarcoma was suspected and this was confirmed on histology. Testing for enzootic bovine leucosis (EBL) was negative, suggesting it was a case of the sporadic form of the disease.



Figure 10: A massively enlarged spleen in a case of sporadic bovine leucosis in a weanling. Photo: Alan Johnson.

SHEEP

Encephalitis and bacteraemia/septicaemia were the most common diagnoses from necropsy in sheep in the RVLs during February 2022.

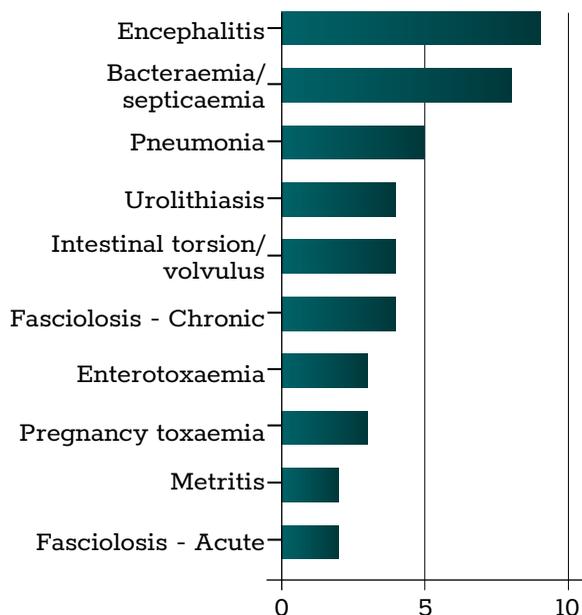


Table 3: The most common diagnoses in sheep submitted for necropsy in February 2022.

GASTROINTESTINAL TRACT

Dosing gun injury

A one-year-old ewe was submitted to Kilkenny RVL with a history of frothing from the mouth and dysphagia. On examination, there was a lesion in the caudal pharyngeal area adjacent to the oesophagus and larynx. There were two therapeutic supplement boluses lodged in this area that were surrounded and walled off by reactive inflammatory tissue and pus. The lungs were heavy and congested and there were multifocal raised white areas on the mucosa of the abomasum typical of parasitic abomasitis. *Trueperella pyogenes* was cultured from the pharyngeal lesion. A diagnosis of trauma due to dosing gun injury was made. A review of technique and a careful examination of equipment for worn/sharp edges was recommended. A high strongyle count of over 3,000 eggs per gram (EPG) was also recorded; it was likely the ewe was immunosuppressed due to the injury, samples from cohorts however were advised to further evaluate.



Figure 11: A dosing gun injury with visible mineral supplement boluses in the pharynx. Photo: Aideen Kennedy.

Parasitic gastroenteritis

A ten-month-old weanling was submitted to Kilkenny RVL for post-mortem examination. There was a history of ill-thrift and some losses in cohorts. The carcass was in poor condition and severely dehydrated. There was a severe extensive abomasitis with extensive suspected hyperplastic glands. There were watery green contents in the small and large intestines. Strongyle eggs were detected in the intestinal contents at a count of 700EPG. An immediate review of parasite control was recommended.



Figure 12: Hyperplastic abomasal glands associated with nematode parasitism. Photo: Maresa Sheehan

Rumen acidosis

Athlone RVL examined a two-year-old ewe with a history of sudden death. There had been no other similar losses in the flock. On necropsy, the rumen contents were very loose and contained an abundant quantity of grain. The pH of the rumen contents was low, measuring 5.4. Histopathological examination of rumen mucosa revealed a moderate, multifocal, suppurative rumenitis with cytoplasmic vacuolation of the superficial epithelium – findings consistent with chemical rumenitis. A diagnosis of ruminal acidosis (grain overload) was made. A review of the diet of cohorts was recommended. A sudden increase in the amount of readily fermented carbohydrate ingested is more important in the pathogenesis of this condition than the actual amount. Sudden temperature changes, e.g., hot or cold weather, may result in temporary reductions in feed consumption, and acidosis may develop once animals return to full feed.

Fasciolosis

Athlone examined an eight-month-old store lamb with a history of dullness the day before death. It was the third similar loss in three days. Its body condition was poor, and the perineum was faecally soiled. Carcass, conjunctiva and lungs were pale. The liver was pale, with haemorrhagic tracts throughout and copious numbers of liver fluke in the bile ducts and gall bladder. There were one or two small haemorrhagic tracts in the lungs suggestive of aberrant fluke. Both the small and large intestinal contents were very fluid, rectal contents were firm and liver fluke eggs were detected in the faeces. A conclusion of chronic/active fasciolosis was made.



Figure 13: A liver with haemorrhagic tracts and adult liver fluke from a lamb with active/chronic fasciolosis. Photo: Denise Murphy.

URINARY/REPRODUCTIVE TRACT

Enzootic abortion of ewes

Two ovine foetuses were submitted to Kilkenny RVL from a flock where there had been approximately 20 abortions from 200 ewes. No vaccines were being used in the flock. There were no gross lesions observed on either foetus. The placenta on the first lamb showed a severe, fibrinous placentitis on both the cotyledons and in the intercotyledonary area. The second placenta showed a placentitis with some fibrin, predominantly in the intercotyledonary area, and marked oedema. There was a PCR positive result for *Chlamydophila abortus*, the causative organism of enzootic abortion of ewes (EAE). Histopathology revealed a severe suppurative necrotising placentitis and lesions in the placentas were consistent with EAE abortion. The source of infection with *C. abortus* is aborting ewes at time of abortion, and through vaginal discharge for three weeks post-partum. It is advisable to isolate affected sheep for three weeks, destroy placentae, and disinfect pens. Keep pregnant ewes away from infected pens and don't use aborted ewes to foster replacement ewe lambs. *C. abortus* is a zoonosis, and a particular risk to immunocompromised or pregnant individuals.



Figure 14: Placentitis in a case of enzootic abortion of ewes. Photo: Aideen Kennedy.

Campylobacter fetus

Dublin RVL investigated a series of submissions totalling eight abortions from a 420-ewe flock, which were vaccinated against *Toxoplasma gondii* and *C. abortus*. All of the submissions were approximately two weeks pre-term. On gross post-mortem examination, one of the foetal lambs examined had multifocal, randomly distributed, small (1-2cm in diameter), circular, light tan-coloured areas on the surface of the liver. No significant gross lesions were identified in other foetuses examined from the holding. The placenta, when presented, had enlarged, pulpy cotyledons, covered with brown exudate. *Campylobacter fetus* was isolated from seven of the eight samples of aborted material examined. Histopathological examination of the affected liver revealed multifocal-coalescing, severe, necro-suppurative hepatitis with marked periportal macrophage infiltration. The placenta presented multifocal necro-suppurative placentitis. These lesions are consistent with *Campylobacter* abortion. In total, 40 ewes aborted from this flock and several weak lambs were born. The literature reports only 20-30 per cent of *C. fetus* abortion cases have gross lesions in the foetus. *C. fetus* is a well-documented cause of ovine abortion. Abortion storms are not uncommon and up to 20 per cent of ewes may abort when a naïve flock is first exposed to infection. The sources of infection for a flock are not fully understood, although carrier sheep are considered the most likely source.

WILDLIFE

A juvenile White-Tailed Sea Eagle (*Haliaeetus albicilla*) was submitted to Limerick RVL for necropsy. The bird had been found in a weak state on the shore near Tarbert, County Limerick, and had died overnight. It weighed 5.11kgs and was in poor body condition. Yellow nodular lesions were seen in the intestine and throughout the liver. The intestines were quite empty with no evidence of a recent feed. Culture of the liver for bacteria did not yield a significant result. Testing was negative for avian influenza. Histopathology identified multifocal lesions of granulomatous hepatitis, enteritis and pneumonia. The lesions were likely to be bacterial in origin, with *Yersinia* sp. infection high on the list of possible aetiologies.



Figure 15: Multifocal yellow lesions in the liver of a White-Tailed Sea Eagle, identified as granulomatous hepatitis. Photo: Alan Johnson.