

Disease Surveillance and Investigation Branch

# DISEASE SURVEILLANCE REPORT

## Northern Ireland Disease Surveillance Report, July to September 2016

- Parasitic pneumonia in cattle
- Blackleg in cattle
- Haemonchosis in sheep
- Acute paraphistome infection in sheep
- Oedema disease in pigs
- Salmonellosis in pigs

These are some of the matters discussed in the Northern Ireland animal disease surveillance quarterly report for July to September 2016

### CATTLE:

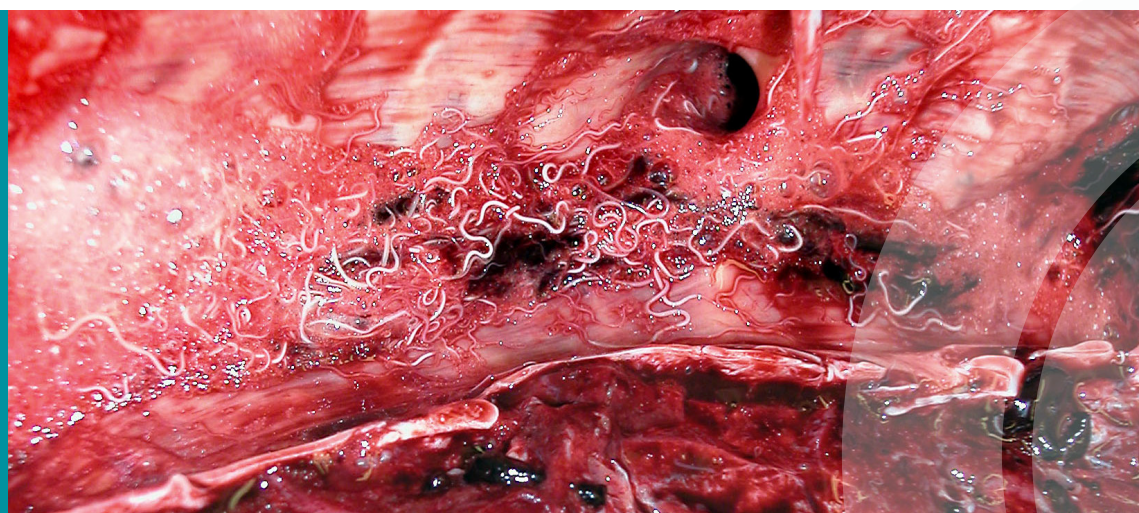
#### Respiratory diseases

Respiratory disease was identified in 53 cattle post mortem submissions between July and September 2016. The most common causes identified included parasitic pneumonia, *Trueperella pyogenes* (eleven cases), *Mycoplasma bovis* (nine cases), *Pasteurella multocida* (seven cases), *Mannheimia haemolytica* (four cases), and *Histophilus somni* (three cases).

#### Parasitic pneumonia

Twenty cases of parasitic pneumonia (husk) were recorded during the quarter compared to ten reported over the same period in 2015.

First and second season grazers and adult animals were involved in outbreaks and AFBI commented on the need to ensure that anthelmintic programmes used to prevent husk in cattle (FIGURE 1) must be designed so as to allow sufficient infection to lead to development of immunity as well as protecting against clinical disease due to *Dictyocaulus viviparus*. Vaccination is a useful aid in the control of husk especially in winter

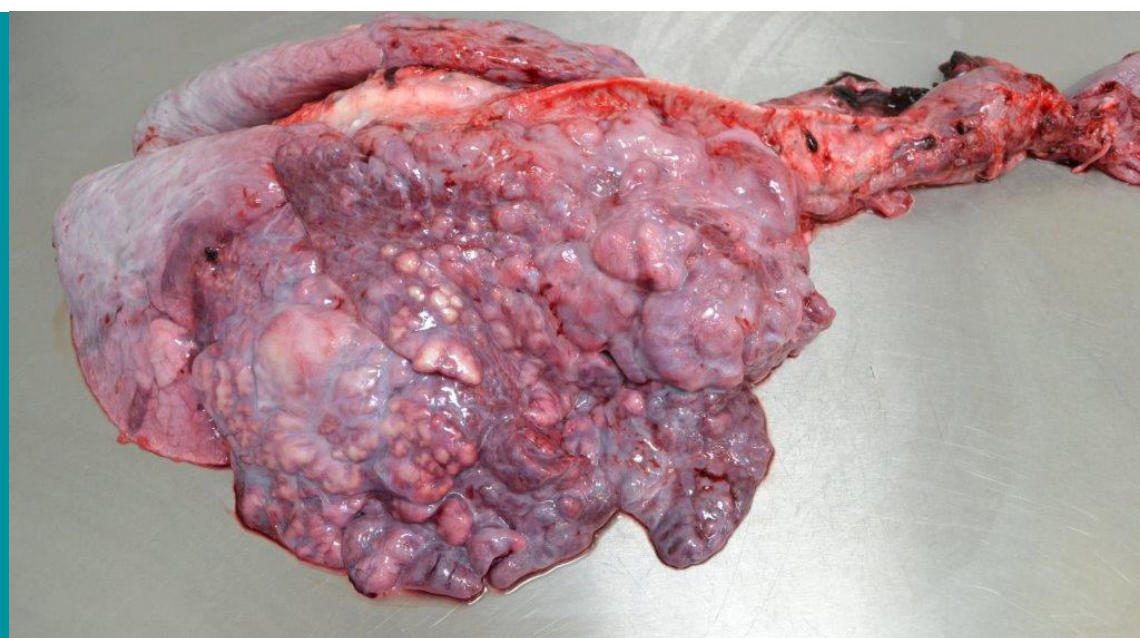


**Figure 1**

Lungworm in a heifer, showing adult *D. viviparus* in the airways

born calves being turned out for the first time the following spring. When vaccinating it should always be remembered that time is necessary to complete the vaccination programme and allow for development of immunity prior to turnout.

Pneumonia due to *Mycoplasma bovis* infection (FIGURE 2) was again diagnosed during the reporting period. One such instance involved pneumonia in a group of three-month-old calves which had been vaccinated against PI3V, BRSV and IBR as well as being treated with antibiotics. Histological examination of the lungs showed focal areas of hyper-eosinophilic coagulative necrosis containing bacterial colonies and bordered by a rim of degenerative inflammatory cells and cell debris. Adjacent alveoli contained an abundance of inflammatory cells and proteinaceous fluid. The bronchi contained neutrophils and macrophages and there was necrosis of the bronchial epithelium. The interlobular septae were distended with proteinaceous fluid. These changes were considered consistent with mycoplasmal pneumonia and *Myc. bovis* nucleic acid was detected by PCR. Intercurrent infection with *Bibersteinia trehalosi* was present with this organism being recovered in profuse pure growth from the lung tissue.



**Figure 2**

Lung of a calf with *Myc. bovis* pneumonia; the raised, cream coloured foci of caseous necrosis typical of the condition can be seen

### Pulmonary actinobacillosis

Cutaneous and pulmonary actinobacillosis was diagnosed from gross and histological examination of neck and lung tissue removed from an adult cow at routine slaughter. On gross examination of the lungs there were multiple, pale, yellowish nodules with purulent foci on incision. Histological examination showed multiple pyogranulomas with masses of coccobacilli surrounded by radiating clubs of eosinophilic immune complex material (club colonies).

### Alimentary diseases

#### Neonatal enteritis

The pathogens identified in neonatal bovine faecal samples during the quarter are shown in TABLE 1. Overall, *Cryptosporidium* species and Rotavirus were the most common pathogens identified.

TABLE 1: Pathogens identified in neonatal bovine faecal samples in Northern Ireland, July to September 2016

Pathogen	Number	
	Tested	Positive ( per cent)
<i>Cryptosporidium</i> species	114	28 (33.3%)
Rotavirus	79	16 (20.3%)
Coronavirus	78	8 (10.3%)
<i>Escherichia coli</i> K99	44	1 (2.2%)

## Other enteric conditions

Parasitic ova found in ruminant faeces samples submitted during the period are shown in TABLE 2.

TABLE 2: Endoparasitic infections in ruminants in Northern Ireland, July to September 2016

	Total	No of parasitic ova					% positive
		Negative	+	++	+++	++++	
Liver fluke							
Bovine	709	667	31	11	0	0	5.9%
Ovine	372	316	22	19	7	0	15.1%
Paramphistome							
Bovine	709	396	73	127	46	67	44.1%
Ovine	371	306	26	29	3	7	17.5%
Coccidia							
Bovine	767	597	131	19	11	9	22.2%
Ovine	388	114	222	40	10	2	70.6%
Strongyle worm egg count	Total	<500 epg	≥500 epg				% Positive
Bovine	767	718	49				6.9%
Ovine	387	296	91				23.5%

≥500 eggs per gram of faeces (epg) was considered of likely clinical significance  
+ Low, ++ Moderate, +++ High, ++++ Very high

## Johne's disease

Examination for *Mycobacterium avium* subspecies *paratuberculosis* (MAP) was carried out by microscopic examination, with Ziehl-Neelsen staining, on 110 bovine faecal samples. 14 samples (12.7 per cent) contained acid-fast organisms typical of MAP. Of 1822 bovine blood samples that were tested for antibodies to MAP 256, (14.0 per cent) were positive.

## Reproductive and mammary diseases

### Abortion

Specimens from 99 bovine abortions and stillbirths were examined during the 3rd quarter. Significant pathogens were detected in 41 cases (41.4 per cent). Of these, *Salmonella* Dublin (17 cases, 17.2 per cent) was the most commonly identified pathogen. Other pathogens identified included *Neospora caninum* (11 cases, 11.1 per cent), *E. coli* (2 cases, 2.0 per cent), and Bovine Virus Diarrhoea virus (BVDv) (2 cases, 2.0 per cent).

The importance of *S. Dublin* infection as a cause of abortion during the reporting period was noted. Herd vaccination is an important aid to controlling this infection in cattle as well as strict bio containment and stringent liver fluke control.

### Mastitis

A total of 356 bacterial isolates were cultured from milk samples submitted from acute and chronic mastitis cases. 42 (11.8 per cent) samples yielded cultures of more than two organisms and were considered to be potentially contaminated. No bacteria were cultured in a further 20 samples. *E. coli* was the most frequently isolated organism and accounted for 25.0 per cent of isolates cultured.

Other frequently identified organisms included *Streptococcus uberis* (18.0 per cent), *Staphylococcus aureus* (7.3 per cent), *Bacillus cereus* (6.5 per cent) and *Streptococcus dysgalactiae* (3.1 per cent).



## Neurological diseases

*Clostridium botulinum* type C / D toxin was diagnosed in 7 cases during the 3rd quarter of 2016.

## Other diseases of cattle

### Endocarditis

Vegetative endocarditis of the aortic valve with renal infarction and congestive heart failure was diagnosed on post mortem examination of a three-month-old calf submitted with a history of sudden death. On gross examination of the heart there was excess pericardial fluid. The heart was firm. There were pale flecks in the papillary muscle of the left ventricular free wall. The aortic valve was encrusted with pale friable material which occluded the lumen of the aorta at the junction with the left ventricle.

### Vena caval thrombosis

Two cases of vena caval thrombosis secondary to hepatic abscessation and causing either septic endocarditis or renal or pulmonary infarction were diagnosed during the reporting period. *T. pyogenes* was recovered from the liver of one case and *Fusobacterium necrophorum* was cultured from the mitral valve in the other.

### Clostridial myositis

*Clostridial myositis* due to *Clostridium chauvoei* (FIGURE 3) or *Clostridium sordellii* was reported on two occasions during the quarter. It was noted that proper vaccination including a full primary course and booster injections according to the vaccine manufacturer's veterinary data sheet achieves good protection against clostridial disease including myositis in cattle. Clostridial vaccines are underused in the Northern Ireland cattle herd.



**Figure 3**

Blackleg in a calf; the dark friable areas of affected muscle can clearly be seen

## SMALL RUMINANTS: SHEEP

### Respiratory diseases

Respiratory disease was identified in four ovine post mortem submissions during this quarter. Pasteurellosis due to *M. haemolytica* infection (two cases), Jaagsiekte (one case), and laryngeal chondritis (one case) were the most common diagnoses.

### Alimentary diseases

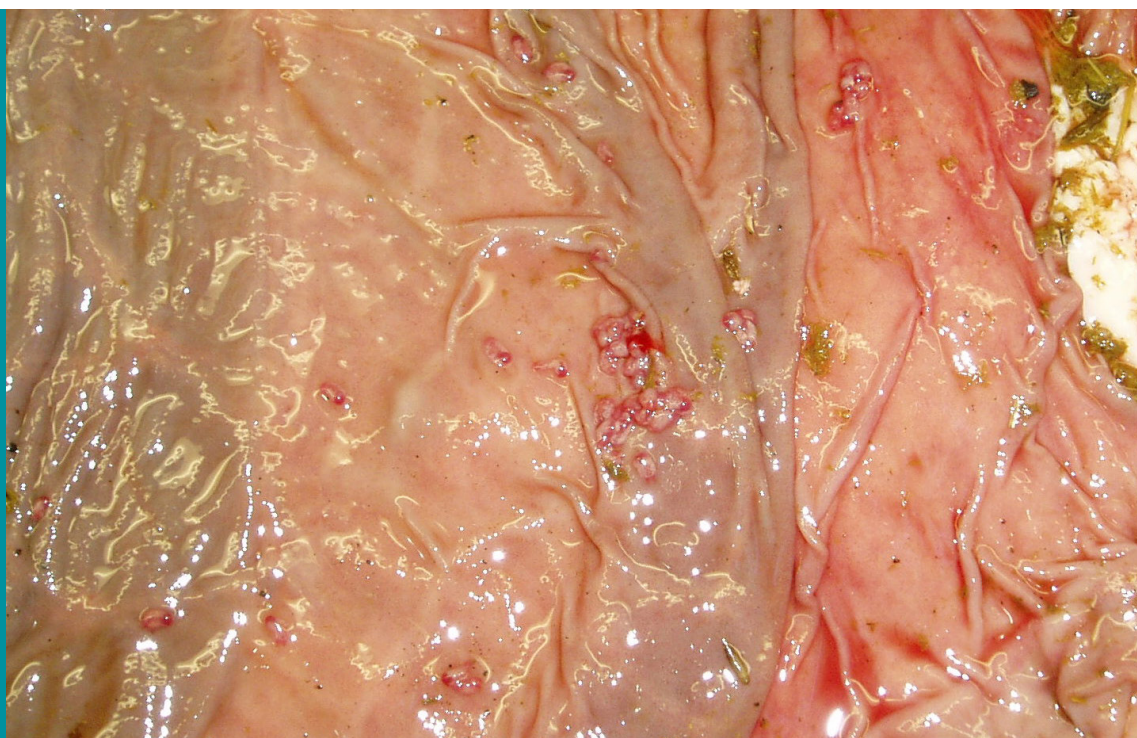
#### Haemonchosis in lambs

Haemonchosis was diagnosed in a three-month-old lamb which was presented for post mortem examination with a flock history of ill thrift and six deaths in a batch of twenty five over a two week period.

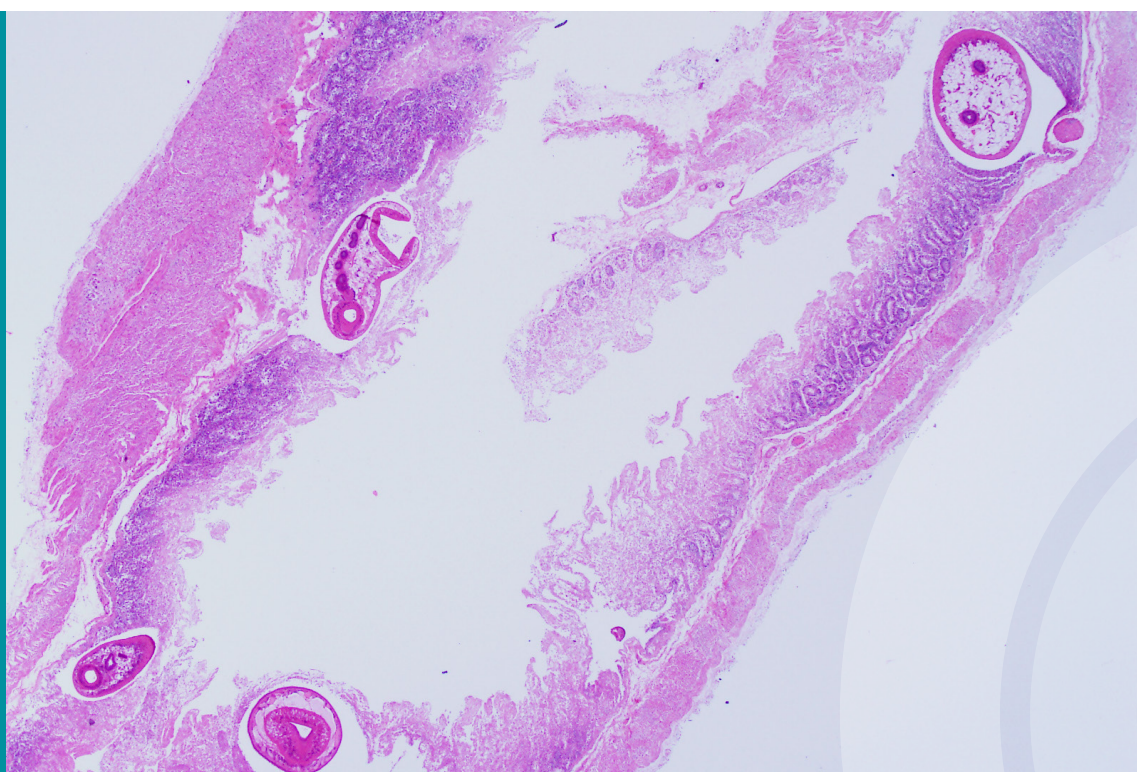


The lambs had been vaccinated against clostridial disease and pasteurellosis and had been treated with anthelmintic around five weeks prior to submission. The carcass was extremely pale, cachexic and oedematous and the abomasum contained dark, bloody fluid and many long, thin coiled worms were grossly visible. Parasitology confirmed haemonchosis and identified that *Trichostrongylus* spp, *Ostertagia ostertagi* and *Cooperia curticei* were also present in large numbers. Coccidial oocysts were detected in the faeces but these were not speciated. It was noted that haemonchosis is not common in sheep in Northern Ireland. Acute paraphistome infection in sheep

In September, acute rumen fluke infection (paraphistomosis) was diagnosed in a group of shearling sheep showing sudden diarrhoea, weight loss and death. On gross examination, the abomasum (FIGURE 4), small and large intestine were distended with liquid contents and 66,900 immature paraphistomes were detected in the small intestine contents. The likely cause of the enteritis was acute paraphistomosis, caused by the enteric migration stage of very numerous juvenile rumen flukes (FIGURE 5). On this farm, 25 sheep deaths, likely due to acute paraphistomosis had been recorded in a single week. There was intercurrent faciolosis with 30 immature and eight mature flukes recovered from the liver.



**Figure 4**  
Immature  
paraphistomes  
on the abomasal  
mucosa



**Figure 5**  
Immature  
paraphistomes  
migrating in the  
small intestine



**Figure 6**

*Galba truncatula*, the intermediate host of the rumen fluke *Calicophoron daubneyi*

In another outbreak, also in September acute paraphistomosis was diagnosed in a group of 60 six-month-old lambs, ten of which had died over a 14 day period. Three lambs were submitted for post mortem examination and small intestinal immature paraphistome counts ranged from 30, 100 to 44, 600. There was intercurrent acute fasciolosis. The finding of rumen and liver fluke infections in the flock at the same time is consistent with the aquatic snail *Galba truncatula* (FIGURE 6) being the intermediate host for both the rumen fluke *Calicophoron daubneyi* and the liver fluke *Fasciola hepatica*.

Rumen fluke are Paraphistomidae, *Calicophoron daubneyi* is the species present in sheep in Northern Ireland. There have previously been a small number of reports of the parasite causing disease in sheep. Clinical disease may occur when large numbers of larval flukes are taken in by grazing animals over a short period of time. The immature flukes attach to the wall of the upper small intestine and feed on plugs bitten from the wall causing severe enteritis. Adult flukes present in the rumen may contribute to ill thrift and production loss although the effect of small burdens is yet to be researched and confirmed.

### Johne's disease

Twelve ovine faecal samples were examined microscopically using Ziehl-Neelsen staining for MAP. No samples contained any acid-fast organisms typical of MAP. 5 ovine bloods samples were tested for antibodies to MAP during this quarter, 1 sample (20.0 per cent) was positive.

### Reproductive diseases

#### Abortion

A single ovine abortion was examined during the 3rd quarter of 2016. *Toxoplasma gondii* was identified as the causal agent.

### Neurological diseases

#### Botulism in sheep

A tentative diagnosis of botulism was made in two growing lambs submitted from a flock in which four deaths had occurred over a short period of time. Small intestine cultures of both lambs were positive for *Clostridium botulinum* C/D toxin when tested by ELISA. This finding indicates the presence of organisms capable of elaborating toxin and might be consistent with botulism. Spreading of broiler house litter on the pasture could not be confirmed.

One case of listerial septicaemia was confirmed by post mortem examination of lambs during the 3rd quarter of 2016. Typical lesions of hepatitis with multiple white foci present throughout the liver were seen. *Listeria monocytogenes* was recovered in profuse growth from the liver.

### Skin diseases

No cases were examined for sheep scab during the 3rd quarter of 2016.

### HORSES:

No swabs were examined for the presence of *Tayorella equigenitalis* during this quarter. 12 swabs were cultured from horses with a history suggestive of strangles during this quarter, one of which was positive.

### PIGS:

#### Respiratory diseases

Pneumonia due to *Pasteurella multocida* infection was diagnosed in group of recently imported pigs. There was marked pulmonary congestion, patchy alveolar oedema, and multiple discrete intra-alveolar bacterial colonies were evident throughout the pulmonary parenchyma. There was fibrinous oedema of the septae. *P. multocida* was recovered in profuse pure growth from the lungs and in moderate pure growth from the liver. It was noted that primary sporadic bronchopneumonia in pigs due to *P. multocida* is recognised and in this case the stress of recent transport may have been contributory.

#### Alimentary disease

##### Salmonellosis in pigs

Salmonellosis due to *Salmonella Typhimurium* infection was diagnosed in a group of eight-week-old piglets recently changed onto a diet which did not contain zinc oxide. Gross post mortem findings were indicative of enteritis and septicaemia. *S. Typhimurium* was recovered in septicaemic distribution and this was considered consistent with salmonellosis.

#### Oedema disease in pigs

Oedema disease in growing pigs associated with *E. coli* O-138, O-139 and O-26 was diagnosed on two occasions in separate units during the reporting period.

#### Clostridial hepatopathy

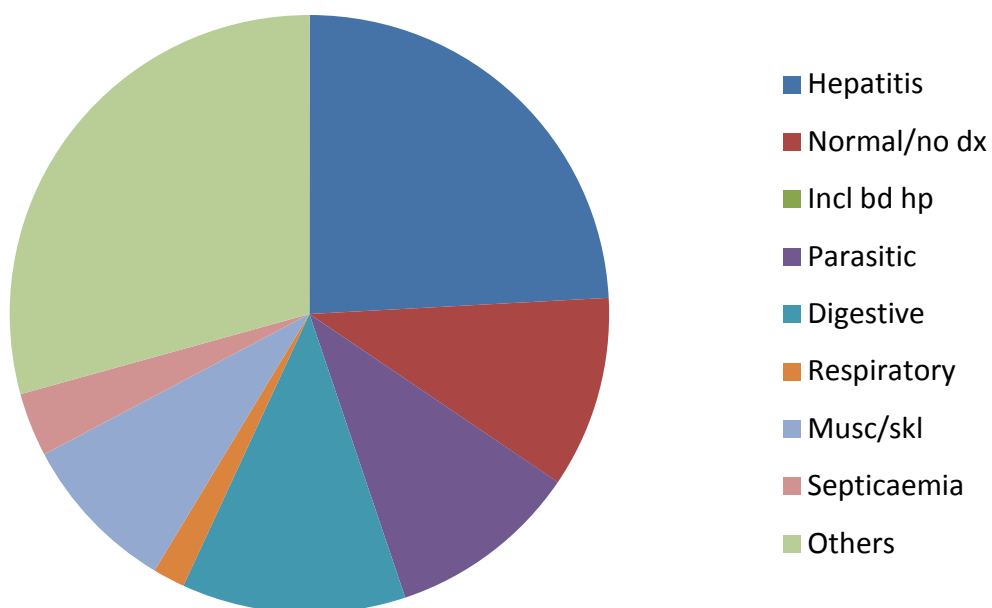
Lesions consistent with infectious necrotic hepatitis were detected in a growing pig which had died suddenly, *Clostridium novyi* was detected by FAT in the liver.

### BIRDS: Poultry

The diagnostic analysis for poultry post mortem submissions during the quarter is given in CHART 1 on next page.

Liver diseases including bacterial hepatitis and hepatic necrosis (fourteen cases, 24.1 %), digestive disorders (seven cases, 12.1 %) and musculoskeletal disorders including tendonitis and tendon rupture (five cases, 8.6 %) predominated.

## POULTRY SUBMISSION DIAGNOSTIC ANALYSIS Q3 2016



### Chart 1

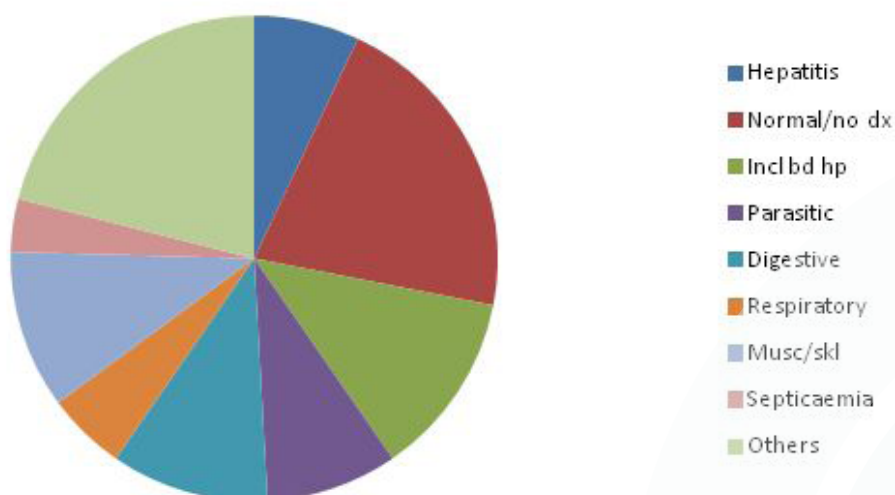
Poultry  
Diagnostic  
Submission  
Analysis







### POULTRY SUBMISSION DIAGNOSTIC ANALYSIS Q2 2016



#### Chart 1

Diagnostic analysis of poultry submissions, April to June 2016.



