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Highlights

- Review of H5N8 Highly Pathogenic Avian Influenza outbreaks in Europe and GB: no further diagnoses of Low Pathogenicity AI in the quarter (pages 4-5)
- New & Re-emerging diseases: Continued increase in diagnoses of blackhead (histomonosis) in chickens; other emerging diseases across different sectors (pages 5-8)
- Changes in the industry and disease patterns: Increase in layer chick placings in the fourth quarter (pages 8-10)

VIDA diagnoses are recorded on the APHA FarmFile database and SAC Consultancy: Veterinary Services LIMS database and comply with agreed diagnostic criteria against which regular validations and audits are undertaken.

The investigational expertise and comprehensive diagnostic laboratory facilities of both APHA and SAC C VS are widely acknowledged, and unusual disease problems tend to be referred to either. However recognised conditions where there is either no diagnostic test, or for which a clinical diagnosis offers sufficient specificity to negate the need for laboratory investigation, are unlikely to be represented. The report may therefore be biased in favour of unusual incidents or those diseases that require laboratory investigation for confirmation.

APHA VICS have UKAS Accreditation and comply with ISO 17025 standard. SAC C VS have UKAS accreditation at their central diagnostic laboratory and at the Aberdeen, Edinburgh, Perth, Ayr, Dumfries, Inverness, St Boswells and Thurso Disease Surveillance Centres which comply with ISO 17025 standard.

From September 2014 APHA contracted the services of third party Post Mortem providers. During October to December 2014, these services were provided by the Royal Veterinary College, the University of Bristol and SACCVS. These providers contribute to the VIDA diagnoses recorded on the APHA FarmFile database and comply with agreed diagnostic criteria. To achieve a VIDA diagnosis, all testing must be carried out by a laboratory with ISO 17025 accreditation.
INTRODUCTION

This report contains analysis of disease data from APHA and SAC Consulting: Veterinary Services (SAC C VS) division of the Scottish Rural College (SRUC) from samples submitted for diagnosis to regional laboratories in the fourth quarter of 2014 compared to the equivalent quarter of previous years. It aims to identify emerging avian disease related threats. The production of the report is underpinned by a large quantity of surveillance data and information, compiled as part of the Defra Food and Farming Group animal disease surveillance programme. Further information can be found on the APHA Vet Gateway: http://ahvla.defra.gov.uk/vet-gateway/surveillance/reports.htm

OVERVIEW

DIAGNOSTIC SUBMISSION TRENDS: July-September 2014

October to December 2014 (Q4-2014) saw a 17% decrease in the total number of avian diagnostic submissions received by APHA and SAC Consulting: Veterinary Services (SAC C VS) compared with Q4-2013 (468 vs. 566). Twenty-seven per cent of avian diagnostic submissions received in Q4-2014 were of carcasses (n=129), and the remainder were non-carcase submissions (n=339). Comparing Q4-2014 and Q4-2013, avian diagnostic submissions received by APHA decreased by 14% (431 vs. 504), comprising a fall in carcass submissions of 42% (98 vs.170) but no change in non-carcase submissions (333 vs. 334). The total number of submissions received by SAC C VS decreased by 40% (37 vs. 62) (Fig. 1). Overall, the largest decrease was in turkey submissions, followed by chickens then game birds, but there was an increase in duck and geese submissions (Fig. 2).

Figure 1: Number of avian diagnostic submissions (excluding wild birds) examined in Great Britain by the AHVLA/APHA and SAC C VS during Q4 (October - December) 2010-2014
Comparison of Q4-2014 with the four-year average for the quarter (Q4-2010 to Q4-2013) showed a decrease of 14% in total numbers of avian diagnostic submissions (non-carcase and carcase) to APHA and SAC C VS (428 vs. 500). This comprised a 1% increase in the total number of avian non-carcase submissions (318 vs. 313) but a 41% drop in the total number of avian carcase diagnostic submissions (110 vs. 187) to APHA and SAC C VS when comparing the same periods.

**Diagnostic submission trend: comments**

The trend over the last four years of declining carcase submissions to APHA and SAC C VS in Q4 continued this year, and continued the trend seen in Q2 and Q3-2014. There are likely to be several reasons for this, including changing economics in the industry and the changed demographics of APHA laboratories and diagnostic post-mortem provision (AHVLA, 2013) which would have been a contributory factor in 2014. However the trend for increasing non-carcase submissions seen in 2012 and 2013 continued. The rise in non-carcase submissions may reflect factors such as practitioners undertaking more post-mortem examinations and the resulting increased use of relevant diagnostic tests at APHA, as well as changes in the economic viability of the various poultry sectors. Avian diagnostic submissions data, trends and other information will continue to be monitored, to understand the relevant risk factors and their potential impact on scanning surveillance in GB and the potential effects on the detection of new and re-emerging threats.

**NEW AND RE-EMERGING DISEASES & THREATS**

Maintaining good biosecurity and hygiene standards, disease awareness and vigilance and prompt investigation of problems are essential to limit both the risk of introduction and spread of infection and the impact of disease outbreaks. Surveillance activities and PVS and industry contact continue to monitor for the presence of any potential new or re-emergent threats in the GB poultry and game bird population.
ONGOING NEW AND RE-EMERGING DISEASE INVESTIGATIONS

H5N8 HPAI outbreaks in Europe

During the period October to November 2014 in Europe outbreaks of H5N8 Highly Pathogenic Avian Influenza (HPAI) were officially reported in poultry flocks in Germany, the Netherlands, Italy and the UK, as well as H5N8 HPAI infection being detected from different species of wild birds in Europe (Defra, 2014a,b; OIE, 2014). Statutory sanitary disease control measures were implemented on all affected poultry holdings. In the UK, one H5N8 HPAI outbreak was officially confirmed on a duck breeder premises in East Yorkshire on the 16th November 2014. Clinical signs of disease were observed over approximately two weeks prior to official confirmation of H5N8 HPAI infection. These comprised reductions in egg production and increased mortality with aspergillosis and bacterial septicaemia also diagnosed as intercurrent flock health problems.

The H5N8 HPAI outbreaks in each country represent different poultry species and production systems and the entry of H5N8 HPAI in to Europe, and its subsequent spread are considered likely to be epidemiologically distinct pathways. Long distance transmission could have resulted from crossover between wild birds congregating in North Eurasian breeding sites resulting in the introduction of infection into the affected EU Member States as there are no known direct bird migration routes from Asia to Western Europe (EFSA, 2014). Extensive epidemiological investigations in all four affected EU Member States failed to show any direct links between all the infected premises. Therefore, indirect contact with wild birds is considered the most likely route of introduction with fomite transmission of virus from environments contaminated with infective wild bird faeces into poultry holdings. Other relevant risk pathways identified comprise indirect transmission via contact with humans or livestock or animal-derived products (EFSA, 2014; Defra, 2015). To date, there have been no reports of human cases of H5N8 HPAI. Further information regarding the H5N8 HPAI outbreaks in Europe is also available online: http://ec.europa.eu/food/committees/regulatory/scfcah/animal_health/presentations_en.htm#03022009

Since January 2014 H5N8 HPAI viruses have been detected from multiple poultry outbreaks in the Republic of Korea as well as poultry in China and Japan. Infection has also been detected from wild birds (species of ducks, swans and geese) in these countries. Furthermore, there has been a considerable increase globally in the frequency of HPAI outbreaks in poultry and reports of infected wild birds over the winter period (2014/15) involving H5N8 HPAI and other HPAI viruses, including Eurasian lineage H5N1 HPAI and other H5N1, H5N2, H5N3 HPAI strains (Defra 2015).

The increase in HPAI outbreaks, including activity associated with reassortant H5 HPAI strains circulating widely in China and South East Asia and the recent outbreaks in Northwest America and Northern Europe, emphasises the need for vigilance and increased biosecurity. In the UK, Defra consider there to be a constant low risk of incursion of any notifiable avian disease into poultry throughout the year, and the current situation in Europe means the UK is at an increased risk at present (Defra, 2014c).

Therefore, all poultry keepers are advised to maintain robust biosecurity measures, vigilance for clinical signs of disease and to promptly report suspect cases of notifiable avian disease to a local APHA office. Further information regarding avian influenza in poultry and wild birds is available:

- Members of the public are also asked to remain vigilant for any wild bird mass mortality incidents and report these to the Defra Helpline: 03459 33 55 77.
- APHA office contact details and further information about avian influenza, and when and how to register your poultry flock are available on the APHA website: https://www.gov.uk/government/organisations/animal-and-plant-health-agency.
- APHA, in collaboration with Defra, also monitors the international situation and distribution of avian influenza detections and further information can be found online at: https://www.gov.uk/government/collections/animal-diseases-international-monitoring#preliminary-outbreak-assessments.
LPAI virus infections in GB

There were no further incidents recorded in Q3 or Q4 of non-notifiable low pathogenicity avian influenza (LPAI), following the two incidents seen in Q2, as described in the Q2-2014 report (Anon, 2014b). However the 12-month pilot scheme enabling private veterinary surgeons in Great Britain (GB) to request chargeable Notifiable Avian Disease (NAD) exclusion testing in chickens and turkeys has continued (AHVLA, 2014; Gibbens and others, 2014). No submissions were tested in Q3 or Q4.

Blackhead (histomonosis) in chickens and turkeys

Histomonosis (caused by the protozoan parasite *Histomonas meleagridis*) has been diagnosed regularly by APHA (formerly AHVLA) and SAC C VS in turkeys, and to a lesser extent chickens, in recent years in GB. As reported in the Q3-2014 report (Anon, 2014c), there is both anecdotal and published evidence that the disease is becoming more prevalent. The VIDA data show consistent numbers of diagnoses in turkeys in Q4 (Fig. 3), as in Q3, but there was an increase in diagnoses in chickens both in Q4 (Fig. 4) and on an annual basis (Fig. 5). As reported previously (Anon, 2014c), the reasons for the apparent changes in the prevalence of histomonosis in chickens and its appearance on indoor units are not understood, but could include changes in virulence of the parasite, emergence of different strains (genetic heterogeneity) and interaction with other disease agents. An example of the latter was the diagnosis during Q4 of concurrent histomonosis and colibacillosis in an indoor broiler breeder flock aged 25 weeks. The control of histomonosis can be problematical as there are currently no licensed treatments available in the EU. Cases of histomonosis will continue to be monitored by means of scanning surveillance.

![Figure 3: Incidents of histomonosis (blackhead) in turkeys in Q4 from 2001 to 2014 (VIDA data)](image1)

![Figure 4: Incidents of histomonosis (blackhead) in chickens in Q4 from 2001 to 2014 (VIDA data)](image2)
Infectious coryza in chickens

An outbreak of respiratory disease was investigated in 21-week old birds in a hobby breeding flock, which comprised predominantly imported but also some homebred stock. The birds had reared well, but a few days after being moved from rearing to breeding accommodation, initially two or three birds were affected with nasal and ocular discharge and periorbital swelling, and two days later another eight birds were affected. Post mortem examination of affected birds confirmed mostly unilateral swelling of the periorbital region (Fig. 6), with clear to mucoid exudate in the sinuses, accompanied by caseation in two birds. Bacterial culture undertaken on a sinus swab yielded suspect *Avibacterium paragallinarum*, the causative agent of infectious coryza, subsequently confirmed by molecular methods. No pathogenic Mycoplasma organisms were detected in pooled tracheal and conjunctival swabs. There was a good clinical response to antibiotic medication in the water. Infectious coryza is a contagious respiratory disease first confirmed in Britain in 2010 (Welchman and others, 2010) and can be transmitted by asymptomatic carrier birds. This is an important disease for which the back yard and hobby poultry sector acts as a 'sentinel' population, and there is the potential for spread to the commercial sector. The disease will continue to be monitored by scanning surveillance activities.

Gizzard erosion in layers

Gizzard erosion (or Gizzard erosion and ulceration syndrome) is well recognized in broilers and a variety of causes have been identified including fowl Adenovirus (Gjevre and others, 2013). An investigation was undertaken in a flock of 4,000 free range layers aged 24 weeks where a few dead birds were being
found daily. There was no effect on egg production in the flock. The combs of the birds were pale, and post mortem examination confirmed pallor in the carcases of the affected birds associated with haemorrhage into the gastro-intestinal tract and also dark gizzard contents. Histopathological examination of the gizzards revealed focal inflammatory changes and occasional deep basophilic intranuclear inclusion bodies, features similar to those seen in broilers affected by gizzard erosion caused by adenovirus. Adenoviruses are considered ubiquitous and can cause a range of conditions in poultry including gizzard erosion in broilers, but this condition is much less well recognised in layer chickens. It is planned to undertake further investigation and scanning surveillance activity, to ascertain more information on the disease in layer chickens and its potential impact.

Update on selected other new and re-emerging disease investigations reported during Q1 – Q3 2014:

Enterococcal and streptococcal infections in broilers – reported in the Q2-2014 report (anon, 2014b). Additional isolations were reported in Q4, including Enterococcus hirae from a heart valve lesion in a 20-day old broiler, E. cecorum from endocarditis and septicaemia in a separate 20-day old broiler flock, and E. hirae from septicaemia in 10-day-old broilers. These organisms appear to be increasingly emerging as pathogens; their origin is unclear but may relate to hygiene issues in the hatchery (particularly in young chicks) or on farm. Monitoring of this group of organisms by means of scanning surveillance will continue.

‘Atypical blackhead’ (tettratrichomonosis) in red-legged partridges - reported in the Q3-2014 report (anon, 2014c); a further case was also reported in Q4 following scanning surveillance investigation in a flock of 1000 partridges where 10-20 birds per being lost per day and 200 had died in total. This manifestation of Tetratrichomonas gallinarum infection appears to be associated with a single strain of the organism, which is otherwise generally regarded as an opportunist in enteric disorders in game birds. The reason for the emergence of a virulent strain in partridges has not been established.

Marek’s disease in turkeys – reported in the Q1-2014 report (anon, 2014a); a further case was confirmed in Q4 by PCR testing of tumour tissue from a 14-week-old turkey which had lost condition and gone off its legs in a small flock of 100 birds. Marek’s disease is principally a disease of chickens but is increasingly being identified in turkey flocks, often following a background of direct or indirect contact with chickens. The availability of a PCR test for virulent Marek’s disease virus (MDV-1) has aided confirmation of the disease in turkeys and thereby enhanced scanning surveillance for the disease in this species.

Respiratory cryptosporidiosis (Cryptosporidium baileyi) in red grouse – reported in the Q3-2014 report (anon, 2014c) which described the more widespread distribution of this disease on moors in northern England. Respiratory cryptosporidiosis was also diagnosed in a red grouse submitted from a moor in south east Scotland in December 2014. The grouse was submitted for a post-mortem investigation as it was suspected of having ‘bulgy’ eyes. This was the only grouse seen to be affected. The diagnosis was confirmed by histopathology where heavy cryptosporidial infection was found in the nasal passage. The confirmation of the disease in Scotland is not unexpected considering the disease is present just over the border and there have been anecdotal reports of suspicious cases in southern Scotland since the first report.

The disease will continue to be monitored by scanning surveillance. There are no known public health implications.

UNUSUAL DIAGNOSES

A variety of endemic poultry diseases continued to be diagnosed in backyard and commercial poultry during Q4-2014 in GB. In these cases no wider threats were recognised and no specific actions required
other than for producers and veterinarians to maintain vigilance for disease problems and investigate as appropriate.

**Leucocytozoonosis in a pheasant**

A presumptive diagnosis of leucocytozoonosis was made in a ten-week-old pheasant, based on the histopathological findings in the brain. The bird was in a group of recently purchased pheasants that were in poor body condition. A one per cent mortality rate over a two day period was seen. The birds submitted alive were tick infested, weak and uneven in size. No evidence of spironucleosis (hexamitiasis) was found. Histological examination in one bird showed perivascular lymphocytic 'cuffing' randomly distributed in the brain, and one area with four parasitic-like cysts suggestive of possible *Leucocytozoon* species infection. However no obviously parasitized blood cells were found in the histological sections in this case. Leucocytozoonosis is a parasitic disease of birds affecting blood and tissue cells of internal organs, and its lifecycle includes invertebrate intermediate hosts, usually biting flies or midges. Infections are most often subclinical but can occasionally cause clinical and even fatal disease as a result of anaemia. The disease is rarely diagnosed in game birds in GB, but this report indicates it should be considered in the differential diagnosis of loss of condition and anaemia in game birds.

**CHANGES IN THE INDUSTRY, DISEASE PATTERNS AND RISK FACTORS**

**Broilers**

There was a slight (0.2%) decrease in the average monthly placings of broiler chicks from UK hatcheries during Q3-2014 compared with the preceding quarter, but a 0.6% increase in December 2014 compared to December 2013 (Fig. 7). Although the numbers have fluctuated, the broiler sector remains the most stable part of UK poultry meat production.

Figure 7: Average weekly commercial broiler chicks placed in the UK from UK hatcheries
**Turkeys**
The numbers of turkey poult placed during December 2014 showed an increase of 22% compared to December 2013 (Fig. 8). However the numbers of turkeys slaughtered were 10% less for the year as a whole compared to 2013, reflecting a continued slight downward trend in the turkey market.

![Figure 8: Average weekly turkey poult placed in the UK by UK hatcheries](image)

**Layers**
The number of layer chicks placed during Q4-2014 was 18% higher than the corresponding figure for the preceding quarter, and the numbers placed in December 24% higher than in December 2013 (Fig. 9). UK egg output in Q4-2014 was unchanged since Q3 but annual output was 0.7% higher in 2014 than 2013 (Fig. 9). Free range eggs accounted for 42.8% of eggs packed in Q4 (Fig. 10). The market is reported to have remained reasonably balanced; the layer sector, in common with other poultry sectors, has been helped by a relative stability in feed prices over the last few months although there was a slight increase in December.

![Figure 9: Average weekly layer chicks placed in the UK by UK hatcheries](image)
Avian diagnostic submission rates and surveillance information will continue to be monitored to assess, where possible, the impact of economic and poultry demographic changes on scanning surveillance activities and endemic, exotic, new and re-emerging avian disease threats.

References


The poultry industry statistics are available online at:


The comments are supplemented by reports from industry and Poultry World.