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 third 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](http://ahvla.defra.gov.uk/vet-gateway/surveillance/reports.htm)

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### Highlights

- **Submission trends:** Decrease of 10% in the total number of avian diagnostic submissions to APHA and SAC during Q3-2014 compared with Q3-2013. This includes a fall in the total number of avian carcase submissions but a rise in non-carcase submissions (pages 2-3).

- **New & Re-emerging diseases:** Blackhead (histomonosis) in chickens and turkeys, ‘atypical blackhead’ in partridges, suspected goose parvovirus infection, respiratory cryptosporidiosis in red grouse (pages 3-5).

- **Changes in the industry and disease patterns:** Egg output has increased slightly but broiler placements have fluctuated (pages 6-8).
INTRODUCTION

DIAGNOSTIC SUBMISSION TRENDS: July-September 2014
July to September 2014 (Q3-2014) saw a 10% decrease in the total number of avian diagnostic submissions received by AHVLA and SAC Consulting (SAC) compared with Q3-2013 (757 vs. 842). Forty per cent of avian diagnostic submissions received in Q3-2014 were of carcases (n=305), and the remainder were non-carcase submissions (n=452). Comparing Q3-2014 and Q3-2013, avian diagnostic submissions received by AHVLA decreased by 5% (632 vs. 665), comprising a fall in carcase submissions of 26% (204 vs. 277) but a rise in non-carcase submissions of 10% (428 vs. 388). The total number of submissions received by SAC decreased by 29% (125 vs. 177) (Figure 1). Overall, the largest decrease was in turkey submissions, followed by game birds then chickens, but there was an increase in duck and geese submissions (Figure 2).

Figure 1: Number of avian diagnostic submissions (excluding wild birds) examined in Great Britain by the AHVLA/APHA and SAC during Q3 (July-September) 2010-2014

Figure 2: Number and species of avian diagnostic submissions examined by the AHVLA and SAC from poultry premises in Great Britain during Q3 (July-September) 2013-2014
Comparison of the four-year average for this quarter (Q3-2010 to Q3-2013) with Q3-2014 showed a decrease of 18% in total numbers of avian diagnostic submissions (non-carcase and carcase) to AHVLA and SAC Consulting (757 vs. 930). This comprised a 10% increase in the total number of avian non-carcase submissions (452 vs. 412) but a 41% drop in the total number of avian carcase diagnostic submissions (305 vs. 518) to AHVLA and SAC when comparing the same periods.

**DIAGNOSTIC SUBMISSION TREND COMMENTS:**

The trend over the last four years of declining carcase submissions to APHA and SAC in Q3 continued this year. There are likely to be several reasons for this; the decline in game bird submissions in England and Wales in 2014 compared to 2013, for example, may have reflected generally favourable weather conditions during the quarter for game bird rearing and release. The changed demographics of APHA laboratories and diagnostic post-mortem provision (AHVLA, 2013) may also have had an impact 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**

**LPAl virus infections in GB**

There were no further incidents recorded in Q3 of non-notifiable low pathogenicity avian influenza (LPAI), following the two incidents seen in Q2, as described in the previous report (anon, 2014). The 12-month pilot scheme enabling private veterinary surgeons in Great Britain (GB) to request chargeable Notifiable Avian Disease (NAD) exclusion testing has continued (AHVLA, 2014; Gibbens and others, 2014). One submission was tested in Q3, and no evidence of LPAI was detected.

**Blackhead (histomonosis) in chickens and turkeys**

Histomonosis (caused by the protozoan parasite *Histomonas meleagridis*) has been diagnosed regularly by APHA (formerly AHVLA) and SAC in turkeys, and to a lesser extent chickens, in recent years in GB. However anecdotal reports from both the UK and from Europe suggest that the disease is becoming more prevalent in both species; for example a high seroprevalence has been reported in Dutch layer chickens (van der Heijden & Landman, 2011). VIDA data show consistent numbers of diagnoses in turkeys in Q3 in recent years, but an increase in diagnoses in chickens in Q3 of 2014 (Figures 3 and 4). Cases of histomonosis have been reported in outdoor birds where they may be explained by transmission of *H. meleagridis* by the intermediate host caecal worm *Heterakis gallinarum*, or by earthworms acting as transport hosts. However anecdotal reports indicate that cases have also been seen in indoor birds on units where transmission by *H. gallinarum* or earthworms is less plausible. The
reasons for the apparent changes in the prevalence of histomonosis 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. The discovery of potentially resistant cyst-like stages of the parasite (Munsch and others, 2009) raises the possibility of transmission by hitherto unrecognized routes. 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 Q3 from 2001 to 2014 (VIDA data)](image)

Incidents of Blackhead in Turkey as % of diagnosable submissions in quarter 3

![Figure 4: Incidents of histomonosis (blackhead) in chickens in Q3 from 2001 to 2014 (VIDA data)](image)

Incidents of Blackhead in Chicken as % of diagnosable submissions in quarter 3

‘Atypical blackhead’ (tetratrichomonosis) in red-legged partridges

In 2013 cases were reported of mortality in a flock of 2,500 red-legged partridges, where 15 birds aged ten weeks died over a two-day period. Post-mortem examination showed profuse pale foci throughout the liver in the birds (Figure 5) accompanied by changes in the caecum, indicating a typhlohepatitis. Histological examination of both organs showed the presence of amoeboid–like protozoa, not typical of blackhead. The use of molecular techniques (PCR and in-situ hybridisation) resulted in the identification of the protozoa as *Tetratrichomonas gallinarum* (Liebhart and others, 2014). Archived tissues from cases seen in 2007 and 2008 were also found to be positive for this parasite. In Q3 of 2014 similar cases were seen in another red-legged partridge flock, where a mortality of 25 per cent was recorded in affected pens of 11-week old birds. The cases appear to be caused by a single strain of *T. gallinarum*. Typhlohepatitis associated with this organism has previously been recorded in some other bird species, for example in captive ducks in Germany (Richter and others, 2010), but this is the first time the disease has been described in partridges, and the first time in GB. Trichomonad organisms are not uncommonly
seen on microscopy of intestinal smears taken on post-mortem examination of game birds, and are usually considered of little significance; the reasons for the more severe manifestation of disease in the cases described are not understood. There are no medicinal treatments licensed that are likely to be effective in the treatment and control of this disease. The disease will continue to be monitored by scanning surveillance. There are no known public health implications.

**Suspected goose parvovirus infection (Derzsy's disease)**

A former dairy farm, with a beef suckler and heifer rearing enterprise, also reared geese for Christmas from their own eggs and others bought in from other farms. Twelve goslings died within the first week of life, often with no premonitory signs, although those that lived for longer showed signs of sleepiness. Post mortem examination revealed a mild catarrhal enteritis and lung oedema in the goslings. Histopathological examination demonstrated intestinal pathology, including intranuclear inclusion bodies, typical of goose parvovirus infection, although the virus was not detected in this case. The disease can be transmitted both vertically through the egg and horizontally between goslings, and the highest mortality is seen in goslings in the first week of life. Derzsy's disease reappeared in GB in 2004 (Holmes and others, 2004) after an interval of several years. The disease is spread by the introduction and purchase of infected stock, and by the retention of survivors and exposed birds from one breeding season to the next. Sporadic cases have been reported in the intervening years since 2004.

**Spread of Cryptosporidium baileyi in red grouse**

Respiratory cryptosporidiosis due to *Cryptosporidium baileyi* was reported as the cause of ‘bulgy eye’ in red grouse on moors in northern England in 2012. A recent report (Baines and others, 2014) describes the results of a questionnaire survey for bulgy eye on 102 managed grouse moors which showed that the condition has become widespread on moors in northern England, and was seen in 48% of the moors surveyed. Affected birds were five to seven per cent lighter than their unaffected counterparts, and disease prevalence ranged from 0.6 to 7.0 per cent.

**UNUSUAL DIAGNOSES**

A variety of endemic poultry diseases continued to be diagnosed in backyard and commercial poultry during Q3-2014 in GB. A selection has also been described in the AHVLA and SAC C VS surveillance highlight reports published in the Veterinary Record. 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.
CHANGES IN THE INDUSTRY, DISEASE PATTERNS AND RISK FACTORS

Broilers
There was a small (2.7%) decrease in the average weekly placings of broiler chicks from UK hatcheries during Q3-2014 compared with the preceding quarter (Figure 6). Although the numbers have fluctuated, the broiler sector remains the most stable part of UK poultry meat production.

Figure 3: Average weekly commercial broiler chicks placed in the UK from UK hatcheries

![Graph showing broiler chicks placed in the UK from UK hatcheries from 2011 to 2014]

Turkeys
The numbers of turkey poults placed during Q3-2014 showed a seasonal increase and the numbers placed during September were 6.1% higher than in September 2013 (Figure 4). However the numbers of turkeys slaughtered were 11% less than in September 2013 reflecting a continued slight downward trend in the volume of turkey meat produced each month.

Figure 4: Average weekly turkey poults placed in the UK by UK hatcheries

![Graph showing turkey poults placed in the UK from UK hatcheries from 2011 to 2014]
Layers
The number of layer chicks placed during September 2014 was 15% higher than the corresponding figure for September 2013 (Figure 5), although the average weekly placings for Q3-2014 were slightly less than the previous quarter. Egg output in Q3-2014 was 1.8% (122,000 cases) higher than Q2, and 148,000 cases higher than Q3-2013 (Figure 6). Free range eggs accounted for 42.3% of eggs packed in Q3 (Figure 7). Data supplied by the British Egg Industry Council (BEIC) show a year on year increase in retail egg purchases since 2008 (Figure 8), and a return to growth in organic sales, but a number of issues remain including competitive pricing in the retail sector. The layer sector, in common with other poultry sectors, has been helped by a decline in feed prices over the last few months.

Figure 5: Average weekly layer chicks placed in the UK by UK hatcheries

![Figure 5: Average weekly layer chicks placed in the UK by UK hatcheries](image1)

Figure 6: The number of eggs packed in UK packing stations compared to the UK farm-gate egg price: 2000-2014

![Figure 6: The number of eggs packed in UK packing stations compared to the UK farm-gate egg price: 2000-2014](image2)

Note: Prices are not adjusted for inflation
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


- Baines, D., Newborn, D. & Richardson, M. (2014) Spread of Cryptosporidium baileyi in red grouse (Lagopus lagopus scoticus). Veterinary Record, 175, 149, available online http://veterinaryrecord.bmj.com/content/175/6/149.1.full.pdf+html [accessed 28 November 2014]


The poultry industry statistics are available online at:


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