These reports aim to identify new, emerging and re-emerging animal-related diseases and threats. Their production is underpinned by a large amount of surveillance data and information compiled as part of Defra’s animal disease surveillance programme. Some of these data can be viewed on the AHVLA website: http://www.defra.gov.uk/ahvla-en/disease-control/surveillance/emerging/

VIDA diagnoses are recorded on the AHVLA FarmFile database and SAC Consulting LIMS databases and comply with agreed diagnostic criteria against which regular validations and audits are undertaken.

The investigational expertise and comprehensive diagnostic laboratory facilities of both AHVLA and SAC Consulting 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.

AHVLA Laboratories and SAC Consulting Veterinary Surveillance Centres have UKAS Accreditation and comply with ISO 17025 standard.

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**Highlights**

- **Submission trends:** Increase of 15% in the total number of avian diagnostic submissions to AHVLA and SAC during Q1-2014 compared with Q1-2013. This includes a rise of 11% in the total number of avian diagnostic submissions received by AHVLA and a rise of 93% received by SAC (pages 2-3).

- **New & Re-emerging diseases:** Ongoing diagnoses of reovirus-associated tenosynovitis in broilers and Marek’s disease in turkeys (pages 3-4).

- **Unusual diagnoses:** Marek’s disease virus genome detected in a lymphoma in a goose; curled-toe paralysis in chicks (pages 4-5).

- **Changes in the industry and disease patterns:** Slight decline in chick placings in the broiler sector compared with the peak of 2012-2013; increase in layer chick placings and an improvement in wholesale egg prices leading up to Easter (pages 5-7).
INTRODUCTION

DIAGNOSTIC SUBMISSION TRENDS: January to March 2014

January to March 2014 (Q1-2014) saw a 15% increase in the total number of avian diagnostic submissions received by AHVLA and SAC Consulting (SAC) compared with Q1-2013 (613 vs. 531). Approximately one-third of avian diagnostic submissions received in Q1-2014 were carcases (n=203), and two-thirds were non-carcase submissions (n=410). Comparing Q1-2014 and Q1-2013, avian diagnostic submissions received by AHVLA increased by 11% (555 vs. 501), comprising a fall in carcase submissions of 5% (153 vs. 161) but a rise in non-carcase submissions of 18% (402 vs. 340). The total number of submissions received by SAC rose by 93% (58 vs. 30) (Figure 1). The biggest rise in submissions was from Eastern England (Figure 2).

Figure 1: Number of avian diagnostic submissions (excluding wild birds) examined in Great Britain by the AHVLA and SAC during Q4 (October-December) 2010-2014

Figure 2: Number and species of avian diagnostic submissions examined by the AHVLA and SAC from poultry premises in Great Britain* during Q1 (January-March) 2013-2014

Comparison of the four-year average for this quarter (Q1-2010 to Q1-2013) with Q1-2014 showed an increase in total numbers of avian diagnostic submissions (non-carcase and carcass) to AHVLA and SAC Consulting (515 vs. 613). However, there was a 12% increase in the total number of avian non-carcass submissions (298 vs. 410) and a 6% drop in the total number of avian carcass diagnostic submissions (217 vs. 203) to AHVLA and SAC when comparing the same periods.

**DIAGNOSTIC SUBMISSION TREND COMMENTS:**

The largest component of the rise in submissions in Q1-2014 compared with Q1-2010 to 2013 was of chicken submissions from Eastern England of which broiler submissions formed the biggest part. The rise may reflect changes such as the increased use of relevant diagnostic assays at AHVLA and the economic viability of the various poultry sectors. A factor contributing to the decline in carcass submissions to AHVLA may have been PVS uncertainty over the effects of Surveillance 2014 (AHVLA, 2013). Avian diagnostic submissions data, trends and other information will continue to be monitored to understand the relevant risk factors affecting 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 population.

**ONGOING NEW AND RE-EMERGING DISEASE INVESTIGATIONS**

**Reovirus-associated tenosynovitis/arthritis in broilers**

Investigations of lameness and tenosynovitis problems in broilers have continued during Q1-2014. A further reovirus related tenosynovitis and pericarditis diagnosis has been achieved in sequential flocks from the same farm over this quarter. A reovirus was isolated in tissue cultures from the affected tendon and heart tissues. It is not known whether the parent flocks used by this enterprise are routinely vaccinated for the virus. Reovirus is a “normal” inhabitant of the intestinal tract and while the majority of strains are considered non-pathogenic, infections with pathogenic reovirus in broilers appear to be on the increase, and the identification of new types has been reported (Troxler and others, 2013). The pathogenic strains are mainly associated with poor, uneven growth and lameness with splay legs and partial to complete tendon ruptures. An age-related resistance develops from two weeks of age but susceptibility prior to that depends on the level of protective maternal antibodies and the virulence of field strains. The efficacy of vaccinal protection conferred by existing vaccines is variable. The disease may cause welfare problems and also a variable economic impact. Although reoviruses are not associated with public health or international trade implications, veterinary investigation of affected flocks is important to monitor the impact on animal welfare and to implement appropriate prevention and control measures (Anon, 2013). The situation will continue to be monitored through AHVLA scanning surveillance activities.

**Marek’s disease in turkeys**

Marek’s disease was identified as the cause of visceral lymphomas in turkeys. There were approximately 25 deaths within a flock of 195, five-month-old turkeys when the investigation commenced in December 2013. Four birds underwent post-mortem examination and all were found to have visceral enlargement and diffuse, cream-white, solid lesions involving the spleen, liver and kidneys and, in one case, nodular lesions in the duodenum and pancreas (Fig 3). A neoplastic condition was suspected and this was supported by the demonstration of lymphomatous changes consistent with Marek’s disease on histopathology, including in the duodenum and pancreas. Real-time PCR assays of spleen confirmed a high level of virulent Marek’s disease virus (MDV-1). Marek’s disease is principally a disease of
chickens but is increasingly being identified in turkey flocks (Blake-Dyke & Baigent, 2013), often following a background of direct or indirect contact with chickens.

**UNUSUAL DIAGNOSES**

Endemic poultry diseases, including some unusual cases, continued to be diagnosed in backyard and commercial poultry during Q1-2014 in GB, with some interesting and unusual investigations outlined below. A selection has also been described in the monthly surveillance highlight reports published in the Veterinary Record (AHVLA, 2014a, b; SAC, 2014). 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.

**Detection of virulent Marek's disease genome in a lymphoma in a goose**

Two adult geese on one premises died six weeks apart after having become lethargic and developing a swollen abdomen, collapse and eventual death. A few weeks later a third bird died after showing similar signs and was submitted for post-mortem examination. Six ducks and some chickens on the premises appeared unaffected. Grossly, the liver was enlarged, pale with irregular pale fatty-looking firm areas. The spleen was also enlarged. Histopathology confirmed a disseminated lymphocytic neoplasm, resembling Marek's disease. A low level of virulent Marek's disease virus MDV-1 was confirmed by PCR testing. Marek's disease is principally a disease of chickens, although virulent strains of MDV have been previously been detected in wild, migratory white fronted geese (*Anser albifrons*) in Japan and Far Eastern Russia without evidence of overt clinical disease, implying that these geese may be resistant to the effects of MDV (Murata and others, 2007). Further investigation is being undertaken on the MDV-1 detected in this goose, and the possible role of this virus in lymphomatous neoplasia in geese and ducks should be investigated further by scanning surveillance.

**Curled-toe paralysis in chicks**

Three, three-week-old chicks were submitted for post-mortem examination from a group of 65 chicks delivered as day-olds, comprising a mixture of breeds. The history indicated curling of the toes under the birds and walking on curled feet, which was confirmed on clinical assessment of the submitted birds which showed marked medial curling of the toes of one or both feet (Figure 4). Post-mortem examination showed possible thickening of the sciatic nerve in the birds but no other abnormalities were noted. The findings and presentation of the birds was suggestive of curled-toe paralysis due to riboflavin (vitamin B2) deficiency in the diet. Histopathological examination of the sciatic nerves revealed changes consistent with riboflavin deficiency. The birds were being fed an organic diet which had no synthetic vitamin supplementation. Curled-toe paralysis is an uncommon clinical manifestation of dietary riboflavin deficiency but can occur when cereal based diets, which can be low in natural riboflavin content, are not supplemented with the vitamin. Unless the nerve damage has been irreversible, there is usually a good response to riboflavin or vitamin B complex supplementation, as reported in this case following B vitamin supplementation via the water.

![Figure 3: nodular appearance of the duodenum and pancreas (centre of image) in a turkey with Marek's disease. Enlargement of the liver and pale liver lesions are visible on the right of the image.](image)
CHANGES IN THE INDUSTRY, DISEASE PATTERNS AND RISK FACTORS

Broilers
There was a small increase in placings of broiler chicks from UK hatcheries compared with the preceding quarter, but placings were slightly down compared with Q1-2013. The average weekly trend in placings has declined slightly, after the peak seen in 2013 (Figure 5).

Figure 5: Average weekly commercial broiler chicks placed in the UK from UK hatcheries

Turkeys
The numbers of turkey poults placed during Q1-2014 were 25% lower compared with the same period of 2013, reflecting a continued slight downward trend in placings over the last two years (Figure 6).

Figure 4: A 3-week-old chick showing signs of curled-toe paralysis associated with riboflavin deficiency
A recent report (British Poultry Council, 2014) highlights the importance of the poultry meat industry to the UK economy. Poultry meat accounts for almost 50% of all meat sales in the UK, of which broilers comprise 93% of sales. The report also shows the contribution of feed prices on the cost of poultry production (Figure 7) and hence the impact of changes in feed prices on profitability. Although they are a relatively low component of the costs, the figures also illustrate the effects of veterinary expenses, and hence of disease, on the profitability of poultry meat production.

**Layers**

The number of layer chicks placed during March 2014 was 26% higher than the corresponding figure for March 2013, and the average weekly equivalent of 0.78 million chicks is the highest number for several years. The upward trend during the quarter (Figure 8) implies an increase in the size of the laying flock, and hence egg production, in the coming months. Egg output was rising in the quarter towards an anticipated peak at Easter, wholesale prices have also risen but there has also been an increase in feed prices during the quarter. Colony eggs accounted for 51% of eggs packed and free range accounted for 43%, compared with 44% in Q1-2013 (Figure 9).
Avian diagnostic submission rates and surveillance information will continue to be monitored to assess, where possible, the impact of financial 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.