

GB Emerging Threats Report

Avian diseases



Safeguarding public and animal health



Quarterly Report: Volume 14, No. 4

October - December (Q4) 2010

These reports aim to identify emerging animal disease related threats. Their production is underpinned by a large amount of surveillance data and information compiled as part of the Defra Food and Farming Group animal disease surveillance programme. Some of these data can be viewed on the VLA website: http://www.defra.gov.uk/vla/reports/rep_intro.htm

VIDA diagnoses are recorded on the VLA FarmFile database and SAC 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 VLA and SAC 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.

VLA Regional Laboratories and SAC Veterinary Surveillance Centres have UKAS Accreditation and comply with ISO 17025 standard.

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Highlights

- **Submission trends:** Severe winter weather conditions amongst other factors leading to a decrease of 18% in the total number of avian diagnostic submissions received by the VLA and SAC compared with Q4-2009, and a 29% decrease in the total number of poultry carcasses examined. However, there was a 6% increase in avian diagnostic submissions and a 13% rise in the total number of poultry carcasses examined in 2010 compared with 2009 (*pages 2-3*).
- **New & Emerging diseases:** No new and emerging avian diseases identified from analysis of available scanning surveillance data. Infectious coryza and European IBV QX investigations were completed. Information about the clinical features, epidemiology, risks and control of both diseases published (*page 3*).
- **Unusual diagnoses:** Seasonal respiratory disease investigated in adult pheasants - an "autumn cough" syndrome with ORT involvement (*page 4*).
- **Changes in patterns & industry:** Production costs, including feed and bird prices continue to rise, pressurising margins. This is a particular problem for the layer sector where over-supply of eggs has led to falling prices. The severe winter conditions also negatively impacted commercial poultry producers (*p6,9*).

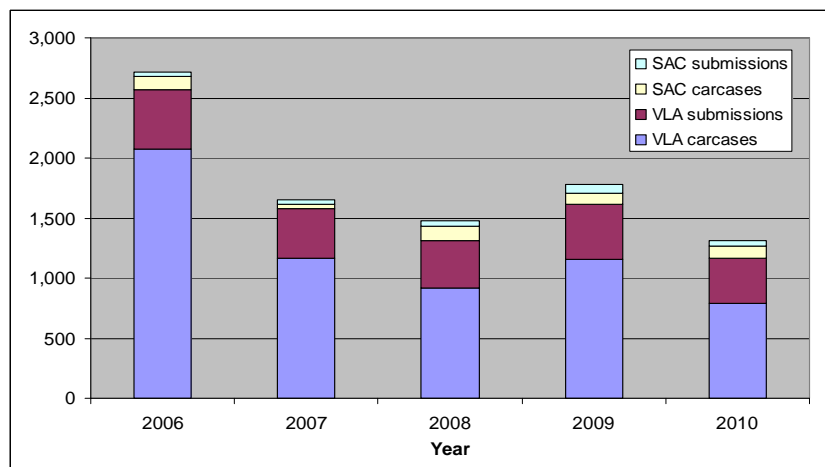
INTRODUCTION

This report contains analysis of disease surveillance data for the period October to December 2010 (Q4-2010) and annualised data for the whole year compared to previous years. Description of any important disease events is qualified by stating whether this is based on quarterly or annualised analysis.

SUBMISSION TRENDS: October-December 2010

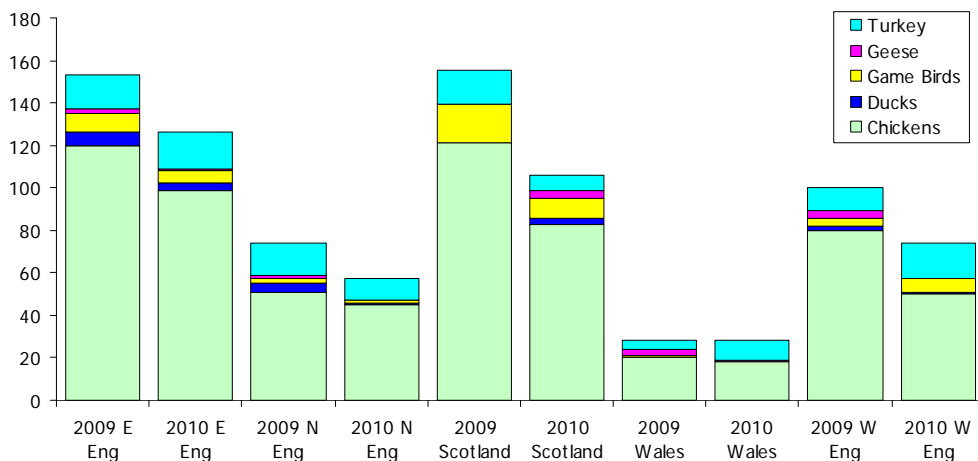
During Q4-2010, there was a decrease of 18% in the total number of avian diagnostic submissions received by the VLA and SAC compared with the total number received during Q4-2009 (432 vs. 524). There was also a 29% decrease in the total number of poultry carcasses (884 vs. 1,253) examined over the same periods (Figure 1). Comparing the four-year average for this quarter (Q4-2006 to Q4-2009) and Q4-2010 showed decreases of 11% (486 vs. 381) and 38% (1,419 vs. 884) respectively in the total numbers of avian diagnostic submissions and poultry carcasses examined.

Figure 1: Avian diagnostic submissions and numbers of poultry carcasses examined in England & Wales and Scotland by the VLA and SAC during the Fourth Quarter (October-December 2010)



The reductions seen during Q4-2010 are partly attributable to the changes made to the VLA’s diagnostic surveillance service since 01 October 2010 (http://www.defra.gov.uk/vla/services/ser_diag_surv.htm). However, the freezing weather conditions and severe snowfalls experienced during November and particularly in December 2010 (<http://www.metoffice.gov.uk/climate/uk/>) also had a substantial impact on the total number of avian diagnostic submissions made to the VLA and SAC from across England and Scotland during Q4-2010 compared to the same time last year (Figure 2). The largest overall reduction was in the number of these submissions from premises in Scotland, by approximately one-third. There was a 20% reduction in the number of avian diagnostic submissions from England, but no change in the number from Wales (also see ‘Changes in Poultry Industry, Demographics & Statistics’ section).

Figure 2: Number and species of avian diagnostic submissions examined by the VLA and SAC from the poultry premises in the super-regions of Great Britain* during the Fourth Quarter (Oct-Dec 2010 & 2009)



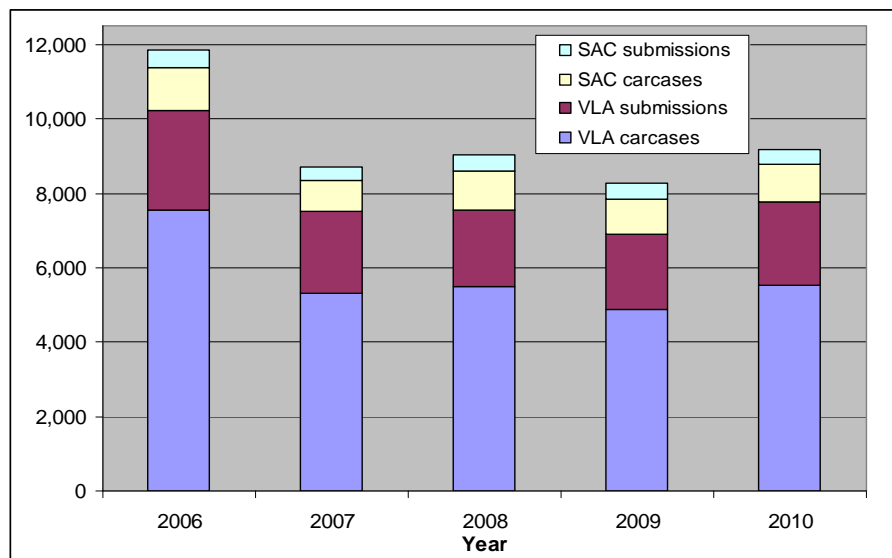
(*Great Britain super-regions: E Eng = Eastern England, N Eng = Northern England, W Eng = Western England. See link to map: http://vla.defra.gov.uk/reports/docs/rep_super_regions.pdf for further information)

Despite these reductions, diagnostic submissions of chickens still comprised three-quarters of all avian diagnostic submissions to the VLA and SAC in both Q4-2010 and Q4-2009 (392 vs. 295 submissions).

SUBMISSION TRENDS: January-December 2010

Overall during 2010, there was a 6% increase in the number of avian diagnostic submissions received by the VLA and SAC compared with the total number received during 2009 (2,624 vs. 2,470). In addition, there was a 13% increase in the total number of poultry carcasses submitted (6,547 vs. 5,810, Figure 3). In the absence of the extreme weather conditions during Q4-2010 the overall increases seen in 2010 would most likely have been greater. Whilst remaining lower than for 2006, year-on-year submission numbers have been broadly similar since 2007, with an overall upward trend. The greater numbers seen in 2006 were a reflection of heightened H5N1 HPAI awareness and concerns at that time. Changes to the structure of the VLA Regional Laboratory network may affect future submission trends and the situation will be monitored.

Figure 3: Avian diagnostic submissions and numbers of poultry carcasses received from England, Wales and Scotland by the VLA and SAC each year (2006-2010)



NEW AND EMERGING DISEASES

During Q4-2010 no new and emerging diseases were identified from analysis of available avian scanning surveillance data and information for broilers, broiler breeders, layers, turkeys, ducks and geese, game birds and backyard flocks.

Over the course of 2010 scanning surveillance activities and close liaison and engagement with PVSs resulted in the identification and investigation of two new and emerging diseases in chickens in Great Britain (GB). These were the detection of Infectious Bronchitis virus (IBV) QX in commercial poultry and Infectious coryza (Fowl coryza) in hobby flocks. Both of these new and emerging disease investigations have been described in the two previous quarterly Avian Disease Surveillance Reports (http://www.defra.gov.uk/vla/reports/rep_surv_avian.htm) and are summarised below.

The VLA's avian disease scanning surveillance activities, funded by Defra and in partnership with PVSs, continue to detect avian disease threats in GB (Irvine and others, 2010). In turn, this highlights hazards and risk pathways that may exist for the poultry industry and poultry populations in general.

Infectious coryza in chickens: Infectious coryza was confirmed by bacteriological and PCR testing in two separate hobby flocks in southern England. This is a well-characterised respiratory disease seen in many other parts of the world, typically spread by poultry movements and suboptimal biosecurity. The disease is caused by *Avibacterium paragallinarum* and is not zoonotic. The trade in hobby and backyard birds provides ready opportunities for the transmission of diseases such as infectious coryza to new

flocks by the purchase of asymptomatic carrier birds. There is also the potential of onward transmission of infection to commercial flocks, particularly if good standards of biosecurity are not practised.

Veterinarians should consider infectious coryza as a differential diagnosis of upper respiratory tract disease, especially in chickens (Welchman and others, 2010).

European IBV QX in commercial poultry: Similar, but not identical European IBV QX viruses have been isolated from backyard and rare breeds poultry flocks in GB since 2007. Comparison of IBV QX S1 genotyping data derived from these backyard flocks and from commercial broiler flocks detected during 2009 and 2010 suggests that there may be distinct routes or risk pathways leading to the introduction of infection into GB. Whilst the precise means of introduction and spread between broiler flocks are not fully defined, and would benefit from further investigation, it would appear that these new and emerging disease incursions of European IBV QX-like strains might have been mediated via commercial movements from Europe. Comparable findings were reported by Valastro and others, (2010). These investigations also demonstrated that VLA scanning surveillance activities resulted in the initial detection and identification of European IBV QX isolates in both backyard and commercial poultry in GB (Irvine and others, 2010). Further information is also available: http://vla.defra.gov.uk/science/sci_ib.htm

ONGOING NEW AND EMERGING DISEASE INVESTIGATIONS

Both of the new and emerging disease investigations described above that started during 2010 were completed during Q4-2010. VLA provided disease alert and advisory material about the epidemiology, risks and control of both IBV QX and Infectious coryza to PVSs, VLA and SAC laboratories and the poultry industry. The latter included the Poultry Disease Group, NFU Poultry Health Group and the British Veterinary Poultry Association. Summaries of VLA investigations were also published in the Veterinary Record. This and other advisory material for vets and poultry producers is available on the VLA website: http://www.defra.gov.uk/vla/reports/rep_surv_avian.htm

There were no other ongoing new and emerging disease investigations during the quarter. Surveillance activities continue to monitor for the presence of any potential new and emerging or re-emergent disease threats in the GB poultry population.

References

- Irvine and others, (2010). Detection of IBV QX in commercial broiler flocks in the UK. *Veterinary Record*, 167:877-879. <http://veterinaryrecord.bmj.com/content/167/22/877.2.full.pdf>
- Valastro and others, (2010). QX-type infectious bronchitis virus in commercial flocks in the UK. *Veterinary Record*, 167: 865-866. <http://veterinaryrecord.bmj.com/content/167/22/865.full.pdf>
- Welchman and others, (2010). Infectious coryza in chickens in Great Britain. *Veterinary Record*, 167: 912-913. <http://veterinaryrecord.bmj.com/content/167/23/912.2.full.pdf>

UNUSUAL DIAGNOSES

October-December 2010

Salmonella Pullorum in a hobby chicken breeding flock: *S. Pullorum* was isolated from fancy breed chicks aged seven days old from a small hobby breeding flock where there had been an increase in mortality post-hatching and infertility in adult hens. *S. Pullorum* is the cause of Pullorum disease or bacillary white diarrhoea in young chicks and turkey and game bird poults. This is a well-characterised disease that is not zoonotic. It is now a rare disease in chickens, only sporadically diagnosed in GB. One VIDA incident was recorded in chickens in 2010, 2009 and 2007 respectively, with no VIDA diagnoses in 2008 or 2006. Due to the problem of vertical transmission the owner voluntarily culled all remaining birds of the affected breed. No significant further threat is recognised, and action is being limited to providing relevant advice to the owner and continued monitoring of avian submissions.

Seasonal respiratory disease in adult pheasants: An "autumn cough" syndrome affecting adult pheasants on a small number of estates in southern England was investigated. This respiratory syndrome has been recognised over a number of years on estates in the same geographical area affecting released birds during the late autumn and winter. There does not appear to be any spread to,

or reports of this syndrome from other parts of GB. The disease is associated with pneumonia and airsacculitis in affected pheasants. The disease described differs from upper respiratory tract diseases (particularly sinusitis or “bulgy eye” associated with *Mycoplasma gallisepticum* infection) more commonly observed in pheasants. A variety of bacteria have been isolated from affected lung and airsac lesions often including *Ornithobacterium rhinotracheale* (ORT). There is usually evidence of underlying mycoplasmosis or viral infection (eg. coronaviruses related to IBV).

As the “autumn cough” problem is seen in released birds in autumn and winter, successful antibacterial medication is difficult to achieve. Conversely, during the pheasant breeding and rearing seasons, typical MG outbreaks may be controlled by antimicrobial treatment. Some veterinary practices also use commercial poultry MG and other respiratory vaccines under the cascade system, but their efficacy is unproven for controlling MG. An inactivated ORT vaccine is licensed in chickens, but it is not known if it has been used in pheasants. Investigation of the most recent cases and those from previous years is ongoing. Currently, this appears to be a seasonal, localised problem. However, surveillance activities continue to monitor for the presence of the disease in order to further investigate the potential causes, any associated risk factors and changes in impact (including for other poultry sectors) and potential control methods.

Lead poisoning in ducks: Lead poisoning was diagnosed in a small backyard duck flock following investigation of paralysis of the legs and wings in an adult ducks. Small particles of material thought to be lead were detected in the gizzard, and high levels of lead were detected in kidney tissue. The Food Standards Agency (FSA) were informed and further investigations revealed that lead flashing on the roof of the duck house had been chewed by squirrels depositing fragments of lead into the duck feed. A farm visit was carried out and advice was given to the owner regarding food safety, protection of the food chain and human health and safety considerations. The unusual events in this case represent a sporadic occurrence. At least one chemical food safety incident is diagnosed and investigated in poultry in GB per quarter, with exposure to lead being the most common cause.

January-December 2010

A variety of endemic poultry diseases were diagnosed in broilers, broiler breeders, turkeys, ducks and geese, game birds and backyard flocks during the year that may be considered uncommon and/or unusual. These cases are described more fully in the quarterly GB Avian Disease Surveillance Reports (http://www.defra.gov.uk/vla/reports/rep_surv_avian.htm). In all of these cases, clinical disease was limited to the affected house or flock, with no evidence of spread, either to other houses on the same farm, or to epidemiologically linked premises. Furthermore, whilst such diseases may be infrequently diagnosed, they are more often than not recognised conditions with well-characterised cause and effect in affected poultry. Where appropriate, treatment usually resulted in a good clinical response and prevention and control measures were implemented following the diagnosis of disease. Therefore, 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 DISEASE PATTERNS, INDUSTRY AND RISK FACTORS

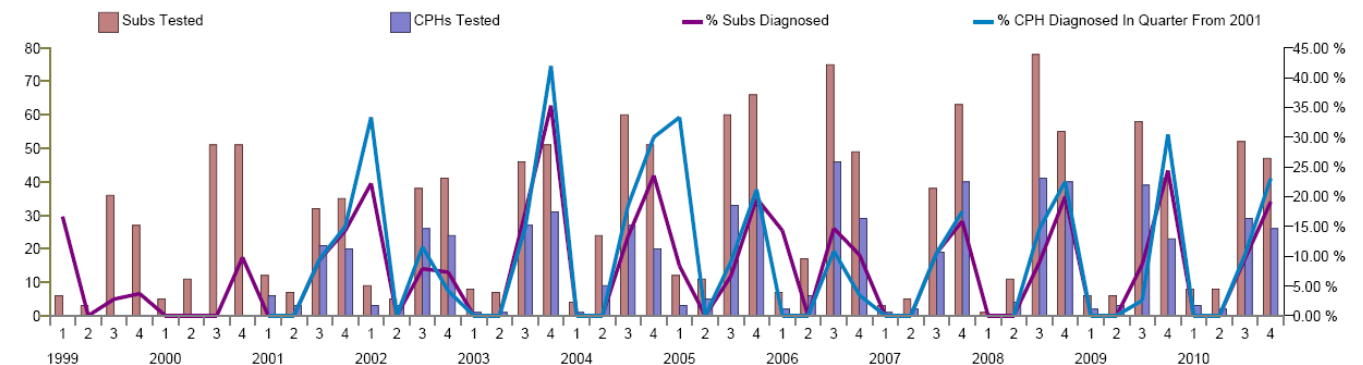
DISEASE PATTERNS: October-December 2010

Mycoplasmosis in turkeys: Exposure of turkeys to infection with well-characterised poultry mycoplasmas (including *Mycoplasma synoviae*, *M. meleagridis* and *M. gallisepticum*) was identified in a number of flocks by serological testing, associated with common disease presentations. These included respiratory signs (infraorbital sinusitis, nasal discharge, facial swelling, sneezing, pneumonia and airsacculitis) and/or joint infections and lameness (septic keel bursitis, exudate and swelling of the hock joints). The identification of mycoplasmal involvement in these cases may have been enhanced by the use of immunoblot serology: a method with increased sensitivity and specificity compared with the more traditional rapid slide agglutination flock screening serology tests. In one of the flocks antibodies to all three agents were detected. The situation will continue to be monitored.

Mycoplasma infections can be part of the complex of respiratory disease in turkeys and may aggravate other viral and bacterial infections (eg. *E.coli*, ORT). Mortality typically is low in uncomplicated cases. However, morbidity may be high causing financial losses to the producer. Biosecurity is central to control. The disease can be treated with antimicrobials, but results may be variable. In each of 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.

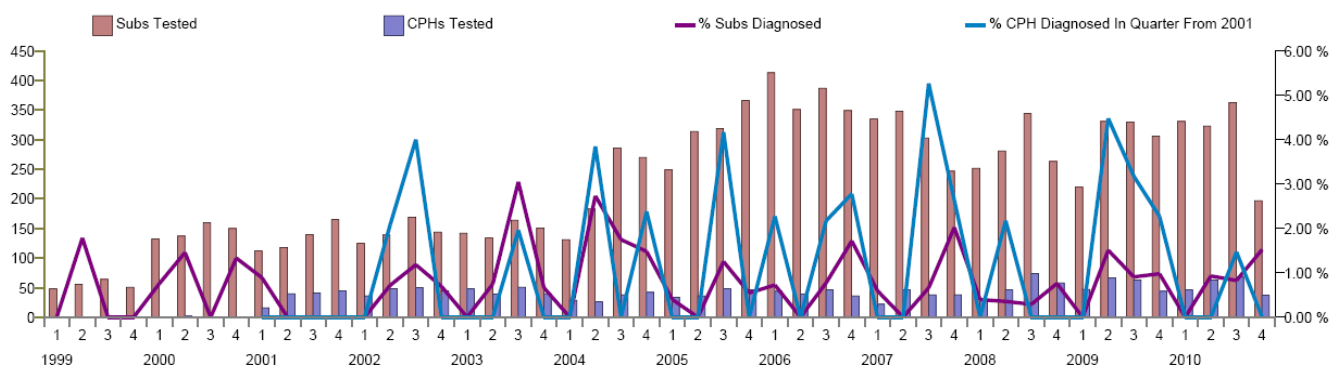
Blackhead in turkeys and chickens: Blackhead (histomonosis) is principally a disease of outdoor reared turkeys in GB. It is mainly diagnosed in small turkey flocks being reared for the Christmas market, and the incidents recorded in VIDA follow a clear seasonal pattern (Figure 4). This pattern continued in Q4-2010. Chickens are considered less susceptible to blackhead than turkeys, and there is not a clear seasonal pattern of incidents (Figure 5). The disease is also considered to be uncommon in housed birds. However, Blackhead was diagnosed in housed broiler breeders during Q4-2010, associated with a persistent, low-grade mortality of 1% over three weeks. When outbreaks do occasionally occur in indoor birds it is assumed that the causative organism, *Histomonas meleagridis*, gains entry to the poultry house as a result of inadequate biosecurity. *H. meleagridis* can survive for up to three years within earthworm or nematode egg (*Heterakis* spp.) transport hosts. It is likely that soil contaminated with these hosts may have been taken into the broiler breeder house and led to the outbreak. Therefore, disease can be prevented by close attention to biosecurity and cleanliness. Outbreaks can be treated with antibiotics, but there are no products currently licensed specifically for treatment, and success may be variable (Hauck and others, 2010). Diagnoses in turkeys represent a seasonal occurrence with no further threat identified. The situation will be monitored with regard to diagnoses of blackhead in chickens.

Figure 4: Incidents of blackhead (red line) in turkeys as a percentage of diagnosable submissions in England and Wales, 1999-2010



Note : Numbers exclude continuation diagnoses of Blackhead and submissions recorded as 'diagnosis not applicable'

Figure 5: Incidents of blackhead (red line) in chickens as a percentage of diagnosable submissions in England and Wales, 1999-2010



Note : Numbers exclude continuation diagnoses of Blackhead and submissions recorded as 'diagnosis not applicable'

Reference

Hauck and others (2010). Factors influencing the activity of the tiamulin against *Histomonas meleagridis* in-vitro. Avian Diseases 54: 936-938.

Severe winter weather during November and December 2010: Heavy snowfalls and prolonged freezing temperatures for most of December caused severe problems for broiler producers and most poultry farming enterprises throughout GB. Scotland was particularly badly affected, with reports of chicken house roofs collapsing due to the weight of snow, frozen water pipes and blocked roads resulting in problems of access to farms for routine activities. Gas consumption increased markedly as daytime temperatures stayed below freezing for prolonged periods. Delays in getting broilers to slaughter were also experienced, resulting in less time for on-farm cleansing and disinfection (which itself was often rendered very difficult because of frozen pipes and restricted mobility with mechanised equipment due to the deep snow). The financial cost of the severe winter is not yet fully known, but is likely to be high, at a time when costs of production are rising. Submissions of commercial poultry for diagnostic post mortem examination were reduced during Q4-2010. This was most marked during December, reflecting the very difficult operating conditions.

No wider disease threats were recognised as a result of the severe winter conditions. However, the poorer than usual cleanouts and reduced "downtime" (the time when the farm is completely empty of birds) are considered likely to result in adverse effects on the performance of subsequent flocks. There are indications in January 2011 that this may be the case, with some broiler flocks already falling several days behind target weight for age by the time they were 3-4 weeks old and 'wet litter' problems reported. The situation will be monitored through routine scanning surveillance activities and PVS contact.

DISEASE PATTERNS: January-December 2010

In addition to the diseases and events described above, the following occurred during 2010.

Salmonella Typhimurium DT8: An increase in the number of reported human cases of *Salmonella* Typhimurium DT8 emerged during 2010 (<http://www.hpa.org.uk/hpr/archives/2010/news3710.htm#stdt8>) in the UK. This is a common duck associated phage type and some human cases were associated with the consumption of duck eggs. Some affected premises were visited by VLA and given advice regarding biosecurity, prevention and control of salmonellae. The HPA and FSA also provided advice reminding consumers and caterers to handle duck eggs hygienically and to cook them thoroughly (<http://www.food.gov.uk/news/newsarchive/2010/sep/duckeggs>).

Monophasic salmonellae: Monophasic strains of salmonella were detected in both layer and broiler flocks, and the VLA carried out advisory visits to some of the affected premises. These strains present as salmonella types 4,(5),12:i:- and determinative and PCR typing can further identify some of these strains to be most likely monophasic strains of *Salmonella* Typhimurium. Similar strains have been associated with outbreaks of disease in animals and people in other parts of Europe. Interestingly, in this country, some of the affected sites also rear pigs, and monophasic strains of *Salmonella* have also been detected from swine. There seems to be an increasing trend in East Anglia for joint pig and laying chicken production, with close proximity of pig and poultry houses on some sites. This could also present a biosecurity hazard for other viral and bacterial diseases. The full impact of these emerging salmonella strains in the UK is not yet certain. The situation continues to be monitored.

Turkey poult enteritis: Enteric disorders in turkeys were highlighted during Q2-2010 (http://www.defra.gov.uk/vla/reports/docs/rep_survrep_qtlya0210.pdf), with failure of turkey poults to thrive, poor performance and diarrhoea reported with high morbidity. During Q4-2010, a case of mucoid enteritis in a sixty-bird turkey flock was investigated. The clinical history, gross pathology and histopathology were considered to be consistent with poult enteritis mortality syndrome (PEMS). This syndrome has been reported in the USA. In the UK the syndrome is considered rare. PEMS may be associated with a number of enteric viral infections, which can be difficult to identify. Surveillance for coronaviruses (one of the viruses that may be associated with PEMS) is possible using conventional virus isolation and the VLA's IBV (coronavirus) RRT PCR test. Turkey poult gut health problems are not uncommon and severity varies. Whilst it is often difficult to definitively identify the causal agent(s), many cases respond to soluble antimicrobial treatment. PEMS is considered to be an unusual diagnosis in the UK and at this time no wider threat is recognised. The situation will be monitored through routine scanning surveillance activities and PVS contact.

CHANGES IN POULTRY INDUSTRY, DEMOGRAPHICS & STATISTICS

Broilers: The numbers of broilers slaughtered (Figure 6), and the number of broiler chicks placed (Figure 7), have continued to rise during each quarter of 2010, and are higher than the corresponding quarters for 2009. This reflects a buoyant demand for poultry meat, but profitability in the industry is increasingly threatened by rising feed prices, particularly of wheat and soya, and there is an increasing problem with supplies of maize.

Figure 6: Quarterly broiler slaughterings in the UK, 2008-2010

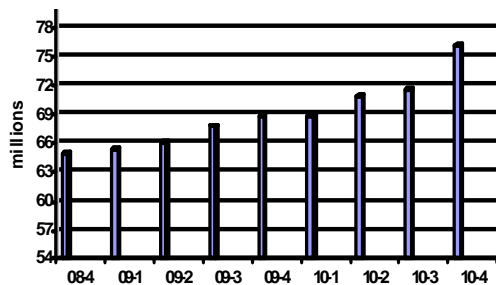
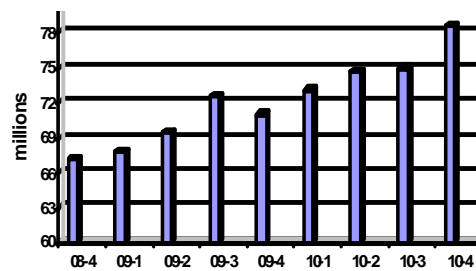


Figure 7: Quarterly broiler chick placings from UK hatcheries, 2008-2010



Layers: The last two quarters of 2010 have seen a downward trend in the numbers of layer chicks placed (Figure 8) in an attempt to reduce the effects of oversupply of eggs in the market. Nevertheless there was a 13% rise in the number of eggs packed in Q3-2010 (the last quarter for which statistics are available) compared with the same quarter of 2009. This was accompanied by an 8.1% decline in egg prices from Q3-2009 to Q3-2010. The decline in egg prices is exacerbated by the continued rise in feed prices, which is also resulting in higher prices for replacement chicks and pullets. There have also been substantial investment costs to the industry in converting to enriched cage systems. Concerns persist regarding illegal supply and import of eggs from hens in conventional cage systems after the implementation of the EU-wide ban on 01 January 2012. All of these cost pressures could mean that some producers may be more reluctant to seek veterinary advice for disease problems, but production problems impacting profitability will nevertheless still require investigation. Free-range and organic eggs accounted for 46% of eggs packed compared with 42% in Q3-2009.

Turkeys: There was a small increase in turkey poult placings in both Q3-2010 and Q4-2010 compared with 2009 (Figure 9). This matches the buoyant demand for poultry meat seen in the broiler sector (above) and halts the downward trend in turkey placings seen earlier in the year.

Figure 8: Quarterly layer chick placings from UK hatcheries, 2008-2010

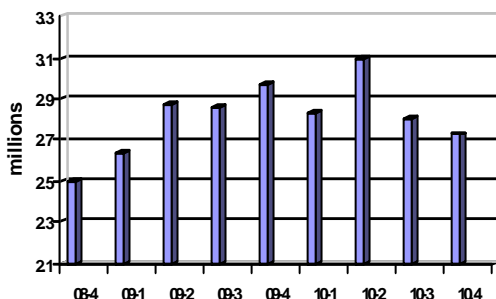
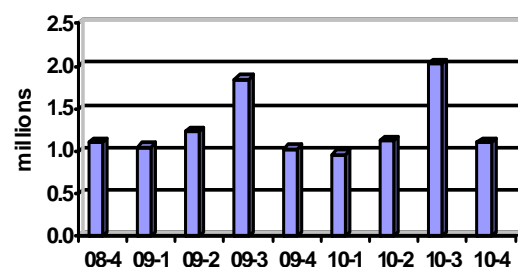


Figure 9: Quarterly turkey poult placings from UK hatcheries, 2008-2010



Backyard flocks: There continues to be an increasing number of backyard and hobby poultry keepers in GB. However, whilst some small flocks (fewer than 50 birds) have voluntarily registered with the GB Poultry Register (GBPR) many have not. Similarly, many small flocks may not have veterinary care. A possible increased risk of disease transmission through multiple contacts associated with small poultry units is also recognised, exacerbated by limited disease awareness and suboptimal biosecurity practices. VLA and SAC scanning surveillance activities provide a key resource for disease investigation and dissemination of information to keepers of small poultry flocks and their PVS. Submissions and

surveillance information received by the VLA/SAC laboratory network will be monitored, with publication of relevant information as appropriate.

Comments

Whilst the broiler industry has remained strong during 2010, rising feed prices (wheat price increased by 78% in the last six months of 2010, and compound feed increased by 41%) will threaten producer margins during 2011. Feed represents approximately 60% of the direct costs of commercial poultry production. The effect of rising feed prices will be compounded in the layer sector where there is an over-supply of eggs, particularly from free-range flocks. Over-supply of eggs has substantially reduced egg prices with impacts on profitability. Chick and pullet prices are also set to rise. The severe winter conditions are considered likely to exacerbate these effects, as other production costs will have also increased.

Industry commentators consider that retail prices (of chicken meat and eggs) will need to rise to compensate for these dramatic production cost increases. However, in the past there has been a delay in retail price rises when direct input costs increase on-farm. In combination these factors are likely to lead to financial difficulties for some, and a drive for increased efficiency across the industry is expected. This may include closure of some facilities.

Costs of production, in terms of feed and energy, are considered likely to remain unsettled for the foreseeable future. This is coupled with the economic downturn affecting retail prices and consumer confidence. These pressures may also lead to increased risk taking in the conduct of normal business by producers and keepers. For example, changes to biosecurity, hygiene and disease control practices (eg. vaccination, disease investigations) may occur with negative effects.

Submission rates and surveillance information will be monitored to assess, where possible, the impact of financial pressures and any changes in poultry industry demographics on scanning surveillance and any emerging disease threats.

Further information about poultry industry statistics can be found at:

- Poultry and poultry meat statistics: <http://www.defra.gov.uk/evidence/statistics/foodfarm/food/poultry/index.htm>
- Egg statistics: <http://www.defra.gov.uk/evidence/statistics/foodfarm/food/eggs/index.htm>

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