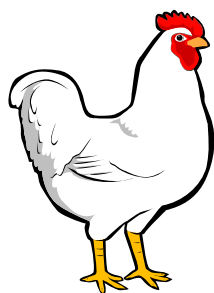


GB surveillance

Avian diseases

Quarterly Report: Volume 12. No. 3

Date: July – September 2008



The VIDA diagnoses are recorded on the VLA FarmFile 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 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 RLs have UKAS Accreditation and comply with ISO 17025 standard. SAC Veterinary Services have UKAS accreditation at their central diagnostic laboratory and at the Edinburgh and St Boswells Disease Surveillance Centres which comply with ISO 17025 standard.

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Highlights

- **Wet summer weather adversely affects young game birds and leads to increased fungal infections** - *Damp feed and bedding led to outbreaks of aspergillosis in poultry and game birds (pages 4, 12, 13 and 15).*
- **Acute respiratory disease of unknown aetiology in ducks** – *A previously described disease associated with basophilic intracellular bodies (page 13).*
- **Acute ILT outbreak prompts suspect notifiable disease report** - *ILT can be controlled by vaccination in commercial flocks. ILT is becoming more common in smaller flocks and may not be recognised by practitioners when the clinical presentation is atypical (page 14).*
- **Third isolation of QX strain of IBV from a “backyard” flock** - *These episodes highlight the presence of this IBV variant within the poultry population. Extent of virus circulation is unquantified; hence the threat posed to the commercial poultry sector is unknown (page 14).*
- **Increased cases of staphylococcal tenosynovitis in pheasant poults** – *Some outbreaks appear to be associated with removal of plastic ‘bits’ prior to entry to release pens (page 15).*

INTRODUCTION

This is the first avian surveillance report that provides an overview of poultry, including gamebirds, health across Great Britain (GB) and follows on from similar GB species reports. It has been made possible through a partnership between Defra, the Scottish Government (SG), the Veterinary Laboratories Agency (VLA) and Scottish Agricultural College Veterinary Services (SAC VS). Previously, surveillance of poultry has been carried out separately, which reduced the likelihood of early detection of important changes in health in this single epidemiological population.

Any major disease occurrence, such as Avian Influenza or Newcastle disease, can have a major impact either by threatening public health and/or animal welfare, or through its economic impact on the agricultural industry and ancillary related industries across the whole of GB. The possibility of the incursion of exotic diseases, the emergence of a new disease, or changes in known diseases are all a concern which scanning surveillance seeks to address.

The network of 15 VLA Regional Laboratories and two Surveillance Centres in England, Wales and Scotland, and eight SAC VS Surveillance Centres in Scotland provide a diagnostic service to private veterinary practitioners across GB. Clinical scanning surveillance information derived from diagnostic samples and carcasses is collected and analysed to determine baseline disease levels in the poultry population. The aim is to provide a targeted assessment of the current poultry disease status of GB and to warn of potential risks from changing disease trends or new diseases, and of zoonotic diseases of human health significance.

Since 1975, disease surveillance in GB has been based on the use of the Veterinary Investigation Diagnosis Analysis (VIDA) database, which contains basic records of the diagnoses recorded against every diagnostic submission made by the VLA Regional Laboratories and the SAC VS Surveillance Centres. In 1998, the VLA started to produce a more detailed dataset within FarmFile - a powerful database, linked to the VIDA database, containing a greater amount of descriptive epidemiological data on all submissions, and incorporating analysis tools used for disease surveillance purposes. This enabled more extensive analysis of data for England and Wales from 1999 onwards.

In 2006 a harmonisation project was initiated to allow the extension of FarmFile analysis to cover Scotland as well. This involved the development of a single, standardised data collection system in December 2006, enabling the collation of the disease surveillance data from all three countries based on harmonised diagnostic criteria and reporting and the use of a standardised submission form in all surveillance centres. This has been achieved through a collaborative project between staff and disease consultants at the VLA and SAC, funded by Defra and SG.

Detailed surveillance data from laboratory submissions for all three countries can now be collated, providing a far greater amount of data for analysis and interpretation by disease consultants at a GB level, resulting in improved disease understanding and efficient use of relevant expertise.

OVERVIEW

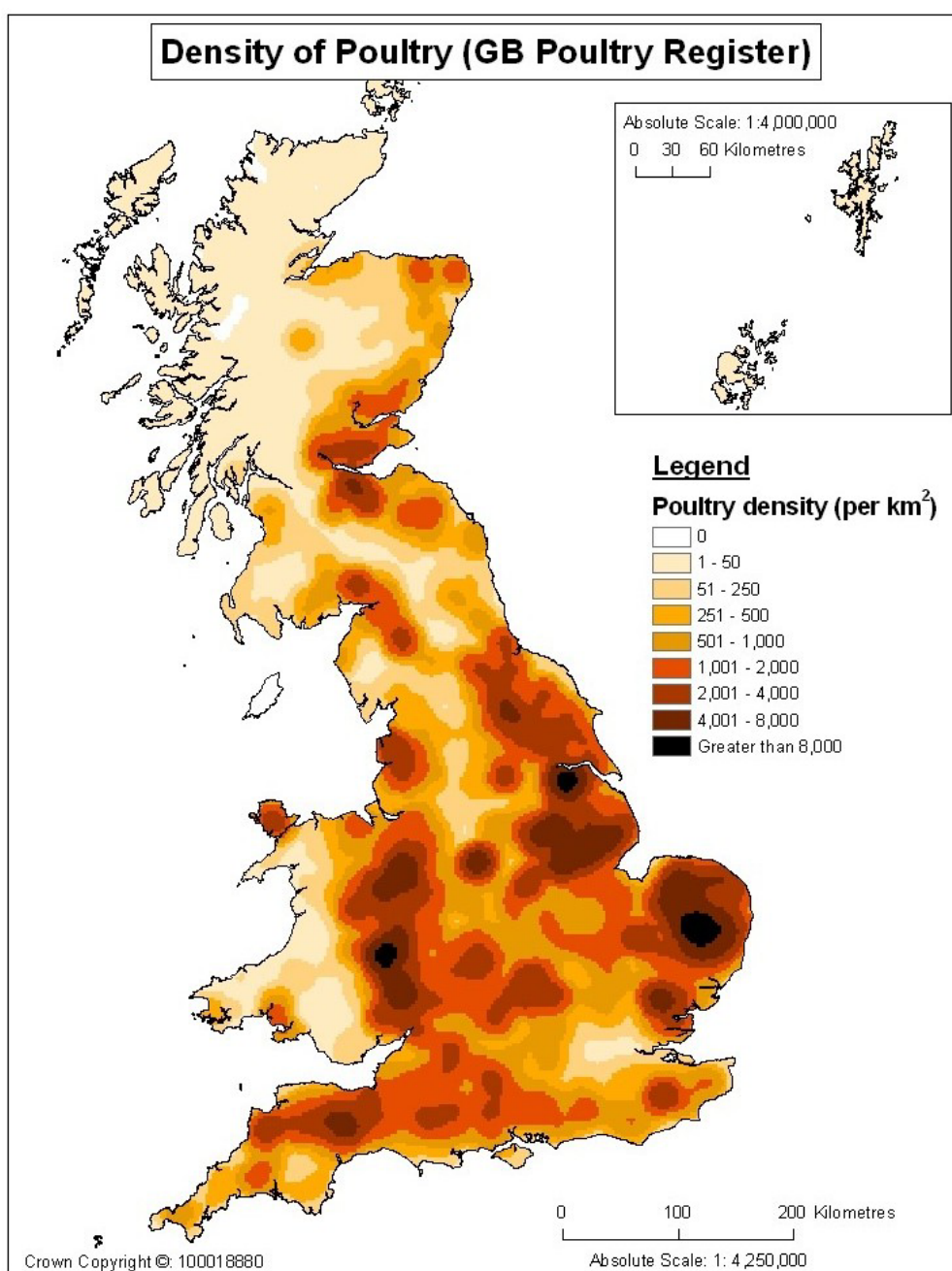
FACTORS INFLUENCING DISEASE AND SUBMISSION RATES

Many factors combine to influence the patterns of disease in poultry, and the ability to detect changes to these patterns through scanning and active surveillance. They include:

Poultry Demographics

The number of poultry premises registered on the GB Poultry Register is 24,269 (on the 11th February 2008). These premises kept a total of 251,913,661 poultry. The map below shows the distribution of the GB poultry population and is based on all premises registered as keeping poultry. It is mandatory for all premises which keep 50 or more poultry to register on the GB Poultry Register. Poultry are defined as chickens (including bantams), turkeys, ducks, geese, guinea fowl, quail, partridges, pheasants, pigeons reared for meat, ostriches, emus, rheas, cassowaries and kiwi.

Figure 1. Distribution of Poultry in Great Britain (2008)



This poultry density map was produced using RADAR. Further information relating to the RADAR poultry population dataset and its associated quality statement may be found on the Defra RADAR web page <http://defraweb/animalh/diseases/vetsurveillance/reports/pdf/poultry-registered080211.pdf>

Weather and climate

In July, mean temperatures were slightly above average in most of England and Wales, but more so in Scotland (averaging more than 1°C). Rainfall was generally above or well above average across most of England and Wales, but close to average across East Anglia. Rainfall over Scotland ranged from below average across the northwest to above average across the southeast.

In August, mean temperatures were slightly (0.5-1°C) above average in all of GB, but it was a very wet month across GB (about 150% of average rainfall for August) with widespread flooding in parts of eastern Scotland.

In September, mean temperatures were generally close to average across England and Wales, but slightly above average across Scotland. Wales had its coolest September since 1994. Rainfall varied widely – with much less than usual in Scotland and more south of the border, especially in Northern England.

The wet conditions during the summer had an adverse effect on young game birds and are also very likely to have contributed to the increase in cases of aspergillosis and other fungal infections seen in turkeys, game birds ducks and geese. There may be many more cases of fungal disease between now and next summer where people use poor quality straw for bedding. There are likely to be many severely mouldy bales of straw this year and poultry keepers may have to find alternative, more expensive, bedding such as wood shavings. The increased cost will be justified if it prevents losses due to fungal infection but may not always be affordable. Demand for good quality bedding materials may also outstrip supply.

The continual wet weather during the summer months also increased the disease risk to birds with access to areas outside of houses. Heavily fouled, waterlogged or muddy areas around free-range houses may lead to an increase in diseases such as blackhead, helminthiasis, erysipelas and spirochaetosis. Pothole management is also an important part of free-range production husbandry.

Economics of the poultry industry

1) Placings

Figure 2. UK Quarterly figures for female Broiler Parent Chick Placings (Average Monthly figures)

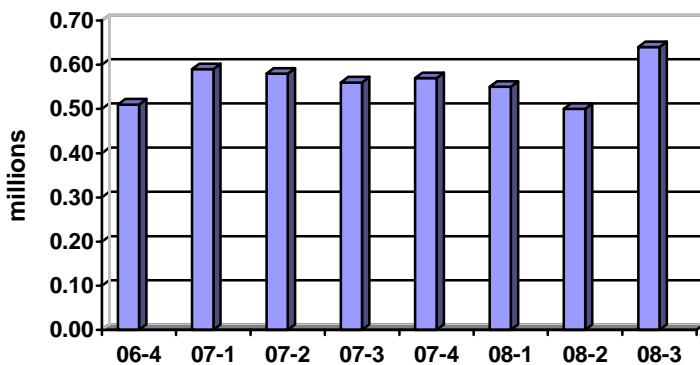


Figure 3. UK Quarterly figures for Commercial Layer Chick Placings (Average Monthly figures)

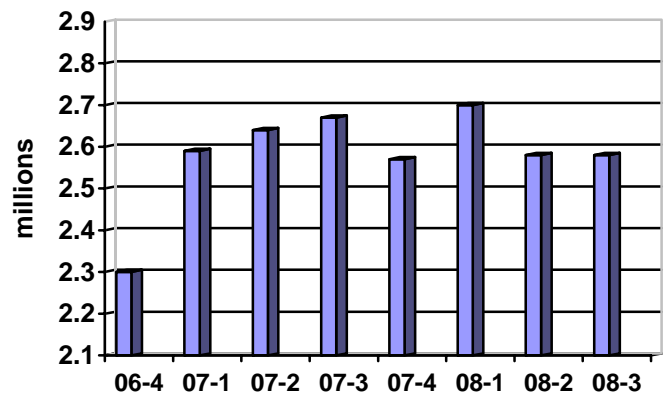


Figure 4. UK Quarterly figures for Commercial Broiler Chick Placings (Average Monthly figures)

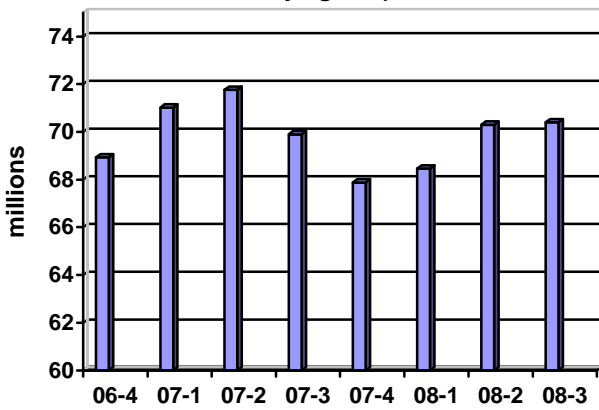
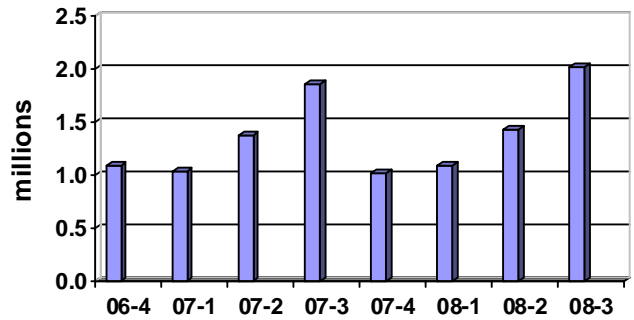


Figure 5. UK Quarterly figures for Turkey Poult Placings (Average Monthly figures)



2) Slaughterings

Figure 7. UK Quarterly figures for Broiler Slaughterings (Average monthly figures)

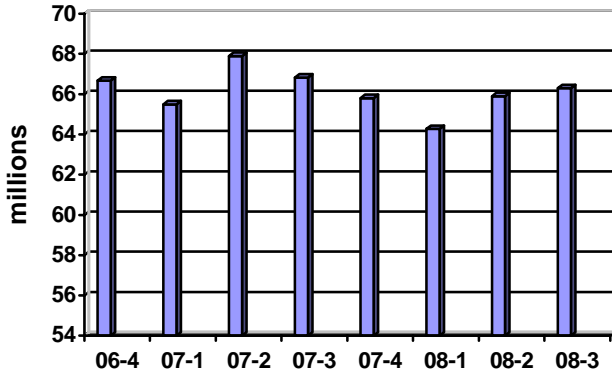
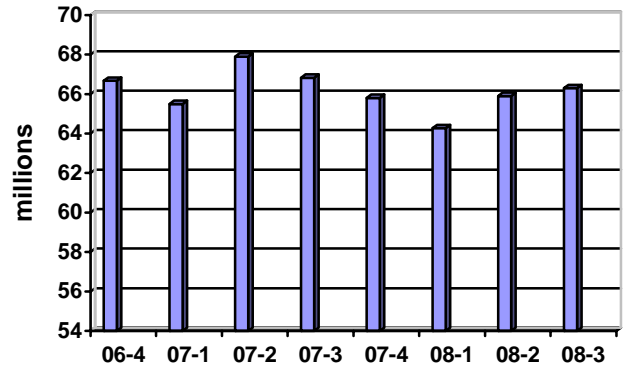


Figure 7. UK Quarterly figures for Broiler Slaughterings (Average monthly figures)



3) Meat production

Figure 8 Total UK poultry meat production (Average monthly figures)

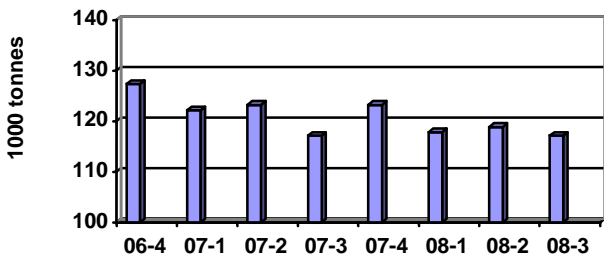
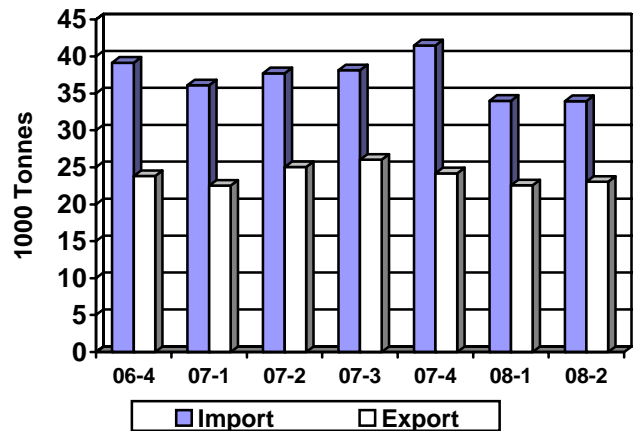


Figure 9. Total Poultry Meat Trade (Average Monthly figures)



These statistics may be found at <https://statistics.defra.gov.uk/esg/statnot/ppntc.pdf>. The data for the latest quarter may be subject to revision

Submissions for scanning surveillance**Table 1. Poultry Diagnostic Submissions in GB**

July – September Quarter	Submissions			Carcases		
	VLA	SAC	Total	VLA	SAC	Total
2008	746	158	904	2457	326	2783
2007	698	194	892	2247	393	2640
2006	775	199	974	2132	530	2662
2005	676	200	876	2126	482	2608
2004	683	165	848	2439	380	2819

NOTIFIABLE DISEASE - GB**Domestic poultry**

No outbreaks of avian notifiable disease (AND) were confirmed in domestic poultry during the quarter July to September 2008 in Great Britain. Clinical material was however submitted to the National Reference Laboratory VLA Weybridge for Avian Influenza (AI) and Newcastle Disease (ND) from six cases of suspected AND in domestic poultry. Cases were investigated in Devon, Cornwall (2), Lincolnshire (2) and Derbyshire. A total of 439 samples was tested comprising sera (135), oropharyngeal swabs (149), cloacal swabs (149) and carcasses (6). Seven submissions were also received from premises undergoing restocking as a result of recent AND outbreaks.

AI Wild Bird Surveillance (AIWBS)

H5N1 Highly Pathogenic Avian Influenza (HPAI) was not detected from any of the 848 wild birds sampled and tested during the last quarter in Great Britain. Evidence of infection with other avian influenza viruses was however detected in fifteen birds. An H3N8 virus was detected in a Mute swan (*Cygnus olor*) that had been found dead. LPAI H5 virus infection was detected from three wild birds that were legally trapped and sampled. Evidence of influenza A virus infection was also detected in one wild bird that had been found dead and ten legally trapped wild birds (Table 2).

Table 2: Number of wild birds tested and results in GB (July - September 2008).

Surveillance activity	Number of birds examined	Positive AI virus result and species of bird	Comments
Legally trapped (ringing) [†]	590	LPAI H5 Mute swan x1; Teal x2 (<i>Anas crecca</i>)	Seasonal targeted surveillance.
Legally shot	Nil	Nil	Surveillance activity ceased.
Found dead*	258	H3N8 Mute Swan x1	Scanning surveillance, all-year-round.

[†] Of the Legally trapped birds tested, a further ten birds (eight Mallard ducks, *Anas platyrhynchos*; two Teal) tested positive for influenza A virus infection (by matrix [M] gene RRT-PCR). H5 RRT-PCR and virus isolation in embryonated fowls' eggs were negative for these birds.

* Of the Found dead birds tested, one further bird (Herring gull, *Larus argentatus*) tested positive for influenza A virus infection (by M gene RRT-PCR). H5 RRT-PCR and virus isolation in embryonated fowls' eggs were negative for this bird.

As a result of increased scientific knowledge and practical experience in handling wild bird H5N1 HPAI incidents, Defra confirmed changes to AIWBS activities in Great Britain for the 2008-09 survey period. Activities are focused on the patrolling of designated reserves by skilled wild bird ecologists and wardens. This is active all year round and provides enhanced screening and assessment of dead wild birds suitable for testing. Members of the public no longer need to report the finding of small numbers of dead wild birds, but are asked to remain vigilant for 'mass mortality' incidents involving 10 or more birds, and report these to the Defra Helpline (08459 33 55 77, 8.00am to 6.00pm Monday to Friday). There are separate arrangements for mass mortality events in Scotland, where findings of five or more dead birds are to be reported, and for Northern Ireland. Further information is available at: <http://www.defra.gov.uk/animalh/diseases/notifiable/disease/ai/wildbirds/survey.htm>

International trade

A total of 65 submissions was received for the purposes of International Trade and health certification testing during the quarter. Forty-nine submissions were received from a variety of avian species, including domestic poultry (chickens, geese), birds of prey, Great Bustards (*Otis tarda*) and an African Grey parrot (*Psittacus erithacus*). Fourteen submissions comprising 29 tissue samples were tested by virus isolation in embryonated fowls' eggs. No haemagglutinating viruses were detected. A further 35 submissions totalling 587 swab samples were tested by influenza A matrix gene RRT-PCR (318) or virus isolation in embryonated fowls' eggs (269), all with negative results.

Avian Influenza serology

Ten submissions totalling 1,870 chicken sera and one submission of 20 Red legged partridge (*Alectoris rufa*) sera were tested for AI antibodies by AGP. Two submissions of 300 chicken sera were received for AI ELISA testing. Seronegative results were recorded for all 2,190 samples.

Avian paramyxovirus (APMV) serology

Nine submissions totalling 36 sera were tested for APMV-1 antibodies by HI test with negative results. Three of these submissions were tested for the purposes of International Trade, with sera submitted from Great Bustards (21), Bleeding-heart doves (*Gallicolumba luzonica*) (2) and one Harris hawk (*Parabuteo unicinctus*). Four submissions totalling ten unspecified dove sera, and single submissions of sera from a Palawan pheasant (*Polyplectron* spp) and an unspecified bird were also tested. Three of the unspecified dove sera were also tested for the presence of APMV-7 antibodies with negative results.

Pigeon Paramyxovirus type 1 (PPMV-1) investigations

Eight cases of suspected PPMV-1 infection were investigated during the quarter in pigeons. The presence of PPMV-1 was confirmed on six occasions. Five of the cases were located in England (Leicestershire, Suffolk, Kent, Hertfordshire, Yorkshire) of which four were positive. Typical enteric and central nervous system (CNS) clinical signs were reported. Three cases were investigated in Scotland (Ayrshire, Dumfries & Galloway, Glasgow), of which two were positive. Unusually CNS signs occurred late on in the course of the outbreaks. No evidence of PPMV-1 infection was detected as part of an investigation into mortality, respiratory signs and diarrhoea affecting feral doves in a wildlife rescue centre.

PPMV-1, a virulent variant ND virus, is the causative virus of the continuing panzootic that began in racing and feral pigeons almost 30 years ago. Although a pigeon variant virus, PPMV-1 still meets the internationally recognised virulence criteria, and under EU legislation when it is found in any poultry species the infection must be regarded as ND. In Great Britain, the last outbreak of ND in poultry caused by PPMV-1 infection was detected in grey partridges (*Perdix perdix*) in Scotland during October 2006 (Irvine and others, *In press*).

NOTIFIABLE DISEASE - INTERNATIONAL DISEASE TRENDS

H5N1 was not reported by any European Union (EU) Member State during the period July to September 2008, in either wild birds or poultry. However, on 10 October 2008, the detection of H5N1 HPAI was reported in domestic ducks on a single holding in Makersdorf, Saxony, close to the Polish border (OIE, 2008a). This was a result of apparently routine targeted virological surveillance sampling, rather than clinical presentation of disease. Concurrently, Eurasian H5 LPAI virus infections were detected in waterfowl in Leipzig zoo, Saxony and in a small mixed poultry holding near Leipzig (PROMED, 2008a). Current programmes of AI surveillance in EU wild bird populations have not resulted in the detection of H5N1 HPAI, but low-level maintenance in discrete local populations of wild birds cannot be discounted.

Preliminary phylogenetic analysis of H5N1 HPAI virus isolates from this most recent poultry outbreak in Germany indicates a high similarity to viruses detected in wild birds in the EU during early 2006 (and specifically an isolate obtained from a Tufted duck (*Aythya fuligula*) in Germany in 2006), and are therefore distinguishable from those H5N1 HPAI viruses associated with cases detected in both wild birds and poultry in Europe since June 2007. Further laboratory analyses continue. However, subject to confirmation this would indicate that the virus has been maintained largely unchanged over a period of approximately 30 months, raising questions as to the mechanisms by which this might have occurred.

Firstly, it may be possible that conditions favourable to survival of the virus in the environment could have supported virus preservation. Alternatively, it may be that the virus has been present in very discrete point(s) within a susceptible wild bird population(s) at a level that is impossible to detect. It could be that the virus has not been continually maintained within a wild bird population throughout this time, linking to the possibility of environmental survival. Furthermore, it could also be reasonably expected that with continuous maintenance of the virus within wild birds, some mutations would accumulate over time.

Such events could create a potential constant, but low risk scenario for the possible introduction into domestic poultry at any time during the year should the appropriate (but as yet not fully defined) conditions be met, coupled with the opportunity for exposure of domestic poultry; for example by breaches or lapses in biosecurity.

Defra have updated their Veterinary Risk Assessment in light of these developments (Defra, 2008).

Globally reports of H5N1 HPAI have continued across three continents, including the Eastern hemisphere and Asia where disease is considered endemic, mainly affecting domestic poultry (UNFAO, 2008a; 2008b). Under reporting of disease remains a significant concern. In addition, on 7 July 2008, Egypt officially informed the OIE that H5N1 HPAI was endemic in the country (OIE, 2008b). Since 17 February 2006, Egypt has reported 1,086 outbreaks to the OIE, the majority of which have occurred in the Nile Delta region, and approximately ten million poultry have either died or been destroyed. In West Africa, Nigeria, Togo and Benin have also reported further H5N1 HPAI outbreaks in poultry (OIE, 2008c; PROMED, 2008b).

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INVESTIGATORY AND ADVISORY FARM VISITS

VLA and SAC veterinarians visit farms at the request of private veterinary surgeons, to assist with the investigation of unusual, severe or difficult disease incidents. VLA veterinarians also visit for statutory purposes (for example, under the Zoonoses Order to investigate outbreaks of salmonellosis). From the second quarter of 2007, the VLA and SAC VS harmonised the way in which these more detailed investigations involving visits to farms were recorded. This is why comparable data is not available for previous years.

Table 3. Farm Investigation and Advisory Visits

July - September Quarter	England Wales	Scotland	Total Visits
2008	9	3	12
2007	11	N/A	N/A
2006	7	N/A	N/A
2005	9	N/A	N/A
2004	8	N/A	N/A

FOOD SAFETY INCIDENTS

Details of incidents investigated by VLA are published in a quarterly newsletter, which is available at: <http://www.defra.gsi.gov.uk/corporate/vla/science/science-foodsafe-chem-report.htm>

Table 4. Food Safety Incidents

July - September Quarter	England Wales	Scotland	Total Incidents
2008	1	0	1
2007	1	N/A	N/A
2006	0	N/A	N/A
2005	0	N/A	N/A
2004	0	N/A	N/A

High tissue lead levels were detected in two incidents in free-range waterfowl and both were thought to be associated with ingestion of lead shot from shooting in the area. In one case ten out of 22 twelve-week-old ducklings died within a few days of being moved on to a new premises where they were being

reared for home consumption. Kidney lead levels indicated that the meat was unsafe for human consumption. The Food Standards Agency was informed and appropriate advice was given. Duck Virus Enteritis was subsequently diagnosed as the cause of the high mortality.

In a second case, a goose on a small pond died as a result of ingestion of lead shot. The incident was not taken as a food safety incident as there were no implications for human health and no birds or eggs were sold for human consumption.

ZOONOSES

Salmonella

In the tables and figures below, an incident is defined as 'the first isolation and all subsequent isolations of the same serovar or serovar and phage/definitive type combination of a particular *Salmonella* from an animal, group of animals or their environment on a single premises, within a defined time period (usually 30 days).

No clinical cases of disease due to *S. Enteritidis* have been recorded on VIDA in chickens during the quarter, or since 2004 when the last case was recorded.

Sampling of chicken layer flocks according to the requirements of the *Salmonella* National Control Programme (NCP) for layers is ongoing. More details on the *Salmonella* NCP in layers can be found on Defra's website <http://www.defra.gov.uk/animalh/diseases/zoonoses/ncp.htm>

Table 5. The annual incidents of *S. Enteritidis* and *S. Typhimurium* in turkeys

	2004	2005	2006	2007	2008 (Q1, 2 & 3)
Enteritidis (total)	0	0	0	0	0
Typhimurium (total)	38	23	38	12	1

Note: The incidents of *S. Enteritidis* and *S. Typhimurium* exclude isolates arising from the 2006/07 EU survey of turkey flocks (see Avian Quarterly Report, Vol. 10, No 3, July-September 2006, Appendix 1).

Table 6. The annual incidents of *S. Binza* and *S.Orion* in pheasants

	2004	2005	2006	2007	2008 (Q1, 2 & 3)
Binza (total)	4	10	21	7	6
Orion (total)	1	3	3	2	2

ENDEMIC DISEASE SURVEILLANCE

COMMERCIAL LAYERS AND LAYER BREEDERS

Red mite

Several cases of severe anaemia resulting in death caused by red mite (*Dermanyssus gallinae*) infestation were seen in both backyard and commercial free-range layer flocks.

The red mite is the most significant parasite of layer chickens in the UK, with effects on bird welfare and production. Control is difficult and is currently aimed at reducing the numbers of mites in the birds' environment. The mites are prolific, being able to complete their life cycle in as little as seven days, acaricides do not penetrate easily into its hiding places and some strains have developed resistance to some acaricides. (see "Poultry Mites: Current European Research" by Peter Bates., Avian Quarterly Report Vol. 5 No 4, October–December 2001) and "The Red Mite Problem", Dr. Bhushy Thind (CSL, York), Avian Quarterly Report Vol. 9, No 2, April-June 2005). Recent research has been aimed at development of a vaccine (a paper entitled "Poultry red mites – a view to vaccination" is to be presented at the BVPA Winter meeting 2008 by workers from the Moredun Research Institute).

BROILERS AND BROILER BREEDERS

Wet litter problems

A number of submissions of live birds from flocks aged between 20 and 30 days experiencing wet litter problems were examined during this quarter. In addition, several batches of fixed tissues for histopathology were received from poultry veterinarians investigating this type of problem. In some cases birds showed chronic bursal atrophy which, though not specific, would be consistent with a previous Infectious Bursal Disease (IBD) challenge (birds often scour for a few days and the litter deteriorates during episodes of acute IBD), but in one case birds from a different house on the same site also experiencing litter problems showed no evidence of bursal atrophy or possible IBD. The intestines showed no consistent histological abnormalities (possible viral or bacterial enteritis was not detected). Coccidial infection was present to varying degrees in some cases, but again was inconsistent and in some cases there was clearly little or no coccidial involvement. A reovirus was also isolated from the intestinal contents of 28-day-old broilers with severe diarrhoea, where other infectious and nutritional causes of enteric disease had been excluded.

"Spiking mortality"

This condition has been seen only sporadically since the early 2000s. However, during this quarter postmortem submissions and formalin fixed tissues for histopathology have been received from several episodes where sudden sharp increases in mortality have occurred in broiler flocks usually of around 20-30 days of age, which had been doing well and had no history of disease or mortality. Findings at postmortem were of birds dying in good condition, often with little or no feed in the upper digestive tract. In contrast to most cases of "spiking mortality" seen in the UK in the early 2000s, some birds in the current episodes have had small amounts of feed in their crop. Many birds showed striking pink colouration of the subcutaneous fat, which intensifies on exposure to air, slight yellowish discolouration of the heart muscle in contracted hearts with prominently congested surface blood vessels, congested livers and less often, congested lungs, and variable pale areas in liver and kidney. Some birds had pale slightly shrunken spleens with patchy "blood-splash" haemorrhages. Conventional histopathology has shown no consistent abnormality. Fat stains demonstrate abnormal quantities of fine lipid droplets in heart muscle and in tubular epithelium of kidney - consistent with mobilisation of fat, as is seen in birds with classical "Fatty liver and kidney syndrome" (FLKS). Significant amelioration of "spiking mortality" episodes in the early 2000s was achieved by increasing the length of the dark period - presumably allowing birds to adapt to periods of fasting, so that they would not become hypoglycaemic if there was accidental interruption to the feed supply. The cause of the recent increased incidence of these episodes in the UK is not known.

Staphylococcal arthritis

Staphylococcal infection caused lameness and increased mortality in two placements of broiler breeder cockerels aged 8 and 13 days. In some affected chicks histological examination of the toe trimmed at day-old in the hatchery (the tip of digit 1, the "thumb") revealed foci of coccoid bacteria consistent with staphylococci beneath the healing wound.

Ulcerative enteritis

Increased mortality in a house of 4,000 25-week-old broiler breeder hens was found to be due to Ulcerative enteritis. Gross and histological lesions were consistent with this condition (also known as "Quail disease"). However, attempts to isolate the causative organism (*Clostridium colinum*) proved unrewarding. Mortality stopped abruptly and did not recur when the flock was given a course of broad-spectrum antibiotic (amoxicillin). This condition is very unusual in chickens of this age.

TURKEYS

Aspergillosis

An increased number of cases of aspergillosis were seen in turkeys (as well as pheasants, ducks and geese) this quarter suggesting a particularly heavy challenge with fungal spores. This may relate to the use of poor quality bedding, which will have been exacerbated by the humid conditions experienced this summer. On one farm fine head tremor was described clinically in 9- to 10-week-old turkey poults. Fungal pneumonia and airsacculitis, mycotic encephalitis, retinitis and iriditis were also present. Mycotic pneumonia due to *Aspergillus spp.* also caused a cumulative mortality of 20% in a batch of 2000 14-day-old free-range turkeys and the increased mortality seen in a batch of turkey poults from two days of age. Postmortem examination revealed multiple small pale nodules in the lungs of some birds, while some birds had a moderate airsacculitis

Producers will need to be particularly vigilant for mould contamination of bedding during the coming months if further cases are to be avoided

Airsacculitis / colisepticaemia

Airsacculitis associated with a colisepticaemia occurred on a number of occasions throughout the quarter. On one multi-age site of commercial meat turkeys, unevenness, stunting and increased mortality were seen from four weeks of age onwards in several batches of birds. Colisepticaemia was a common post mortem finding but some birds had a caseous infraorbital sinusitis and airsacculitis. An unvalidated RRT-PCR test for avian metapneumovirus (aMPV) was carried out on a number of oropharyngeal swabs and one swab from 5-week-old birds (that had not been vaccinated for aMPV) was positive. On another farm, swollen heads were described in 10- to 14-week-old poults. Birds had distension of the infraorbital sinuses, which contained frothy clear mucus, and isolates of *Escherichia coli* and *Pseudomonas aeruginosa* were made from various sites. Possible initiating agents in such cases include aMPV (turkey rhinotracheitis virus), *Mycoplasma spp.*, and *Ornithobacterium rhinotracheale*.

Coccidiosis

Clinical coccidiosis leading to the formation of caecal casts was seen on a number of occasions. One outbreak in 11-week-old turkeys appeared to have precipitated clostridial necrotic enteritis. Caecal coccidiosis, seen in 6-week-old poults, was associated with a return to starter feed when their current feed ran out.

It is rare to see severe clinical coccidiosis causing caecal casts in commercial turkeys on coccidostats. The humid conditions experienced this year may have led to ideal conditions for coccidial sporulation.

Avian tuberculosis

Avian tuberculosis was responsible for ill-thrift and sudden death on a site with several different breeds of turkey. Miliary lesions were seen on post-mortem examination in the liver, spleen and abdominal

connective tissues of two affected birds. Ziehl Neelson-stained smears revealed acid-fast bacilli typical of Mycobacteria and consistent with a diagnosis of avian tuberculosis.

DUCKS AND GEESE

Aspergillosis

Heavy losses in eight- to nine-day-old ducklings were shown to be due to aspergillosis. Although early cases displayed only reddening of lung tissue, and only one bird had miliary lung lesions, *Aspergillus fumigatus* was isolated from all lungs cultured. Further dead birds examined on-farm showed the typical gross lesions of mycotic pneumonia. Poor quality bedding had been used, and it was considered likely that heavy fungal spore contamination of the environment had led to the incident.

Riemerella anatipestifer infection

Riemerella anatipestifer infection was the cause of death or culling in 30 out of a group of 1,350 5-week-old goslings over a three-day period. They had been out at grass for seven days and presented as collapsed birds, unable to walk with watery diarrhoea and a slight head tremor. Lesions demonstrated included extensive pericarditis, perihepatitis and airsacculitis and *Riemerella anatipestifer* was isolated from lungs and airsacs. *Riemerella anatipestifer* infection takes place through the respiratory tract or through wounds on the skin, particularly the feet. Predisposing factors include stress, such as overcrowding, inadequate ventilation, poor hygiene and exposure to adverse weather.

Acute respiratory disease of unknown aetiology

A sub-acute diffuse pneumonia associated with basophilic forms was diagnosed in a domestic duck from a small backyard flock. Such forms have been seen previously in ducklings as an overwhelming infection of lung tissue and this organism has never been accurately identified. In this case there had been one adult duck and one duckling fatality from a group of around 25 ducks on the holding. The submitted duck had been ill for a few days prior to death with a non-specific malaise and loss of appetite. The condition was first reported in the UK in 1987 and, in the intervening years, the VLA and SAC have seen a number of cases of this apparently overwhelming infection, usually in ducklings.

The condition was first described in Canada in 1980 (Julian, RJ and Galt, DE, (1980) *Journal of Wildlife Diseases*, **16**, 39-44) and first reported in the UK in 1987 (Randall *et al.* (1987), *Avian Pathology*, **16**: 479-491). The organism is thought to be a yeast-like eukaryote. It is apparently widespread in North America, Europe and New Zealand, and occurs primarily in Muscovy ducks, but can also affect other species.

Duck Viral Enteritis (duck plague)

Duck Viral Enteritis (DVE) was the cause of a sudden rise in mortality in 5 to 6-week-old ducklings on a commercial unit. Characteristic diphtheritic and necrotic intestinal changes were seen at postmortem examination and large numbers of coccidia were demonstrated on wet smears. However, a herpesvirus typical of DVE virus was subsequently isolated from tissues. There was no known contact with wild birds and the source of the virus could not be established.

Duck Viral Enteritis remains a seasonal disease of waterfowl, with episodes most commonly occurring during the spring months through to June.

Goose Parvovirus

Six separate disease episodes in goslings with clinical and pathological features consistent with Goose Parvovirus (GPV) were investigated in England during June, July and August 2008. Four of the flocks were located in South-west England and clear epidemiological links were identified between these four sites. One of these flocks imported one-day-old goslings, reported to be from GPV vaccinated parent stock, from Denmark, with onward sale to the other three sites. The VLA investigated two of these flocks following submissions of affected goslings to different VLA Regional Laboratories, and clinical findings consistent with suspected GPV were reported from the two further flocks. Two other apparently unconnected premises located in Northern England were also investigated. Both flocks had GPV-unvaccinated breeding stock and reared geese for the Christmas market. The retention of breeding stock infected during previous years was suspected to be the source of infection. To date it has not been possible to isolate GPV in samples collected from affected goslings submitted to the VLA from the two flocks investigated in South-west England. However, serological evidence of infection has been detected in one of the affected, GPV-unvaccinated flocks in Northern England, consistent with exposure to circulating GPV infection.

Further details describing these cases and the epidemiology of GPV have been published in the *Veterinary Record* (Irvine and others, (2008) *Veterinary Record*, **163**:461). This has resulted in raising the awareness of veterinary surgeons and their goose-farming clients, the British Poultry Council and the related Goose Sector Group, as well as provoking media interest from *The Times* and BBC Radio 4's 'Farming Today' programme (24 October 2008).

BACKYARD FLOCKS

Intestinal dilation in layers

VLA reported this syndrome in free-range organic layers in 2005, (Twomey, F., and others, (2005), *Veterinary Record*, **157**, 463-464). In that incident three houses of 7,500 to 8,000 layers on two separate sites were affected. Affected birds were underweight, not in-lay and had severe dilation centred on the midpoint of the small intestine for a length of 20cm. That letter in the *Veterinary Record* prompted a report from a private veterinary practice that had also diagnosed intestinal dilation adversely affecting egg production on a large multi age free-range farm, (Perez, S., (2005), *Veterinary Record*, **157**, 123-124). Mortality was initially low but egg production was reduced and the birds were thin. In September 2008 a further incident was diagnosed, this time in a backyard flock of laying hens submitted to the VLA. Three out of 20 adult hens died after showing signs of malaise for 24 hours before death. One affected bird examined had a striking dilation of the mid small intestine which had a diameter of 2cm. Previous cases in free-range laying hens, described above, had occurred in birds in poor condition, but in the backyard flock the birds had been in good bodily condition. The underlying cause of intestinal dilation remains unclear.

Infectious Laryngotracheitis (ILT)

High unexpected mortality in a flock of 25 backyard hens prompted a report from the VLA to the Divisional Veterinary Manager at the local Animal Health Office to discuss the possibility of an avian notifiable disease. Five birds from a group of 25 were found dead on one day, with three further deaths and respiratory disease and sneezing reported before submission. Further enquiries ruled out the possibility of an avian notifiable disease. ILT was diagnosed following laboratory investigations. It was thought that introduction of the virus to the flock may well have occurred when coming into contact with other birds at poultry shows.

ILT was also confirmed by virus isolation on two occasions in backyard flocks in Southern England that presented with respiratory signs and mortality. In one flock of 100 chickens aged 10-weeks, 50% mortality was experienced in less than two weeks. In a second free-range flock of 300 adult Pekin bantams, 10% morbidity was reported with 7% mortality.

QX strain of Infectious Bronchitis virus

An Infectious Bronchitis virus (IBV), which showed an antigenic relationship to the QX strain in one-way HI serology, was isolated from samples of kidney and trachea from adult Light Sussex hens. Respiratory signs were reported affecting five of the 17 chickens in the flock, and a single bird had died. Two affected chickens were submitted to the VLA for investigation. Consistent post-mortem findings included conjunctivitis (with serous ocular discharge), tracheitis, cranial airsacculitis and marked enlargement and pallor of the kidneys with visceral gout. Histopathology confirmed an acute multifocal moderate heterophilic tubulonephritis. Nephritis appears to be a typical pathological finding in chickens infected with IBV QX, often with elevated mortality. Egg production problems have been reported in layers (Liu and others, (2006) Archives of Virology **151**,1133 –1148; Beato and others, (2006) Proceedings of the Fifth International Symposium on Avian Coronaviruses and Pneumoviruses and Complicating Pathogens. Rauschholzhausen, Germany, May 14 to 16, 2006. pp. 167-170) and proventriculitis in affected broiler flocks in China (Yu and others, (2001) Avian Diseases **45**,416-424).

This represents the third isolation of IBV QX from backyard chickens in Great Britain over the past 14 months as a result of VLA scanning surveillance activities for endemic and new and emerging diseases. (Gough and others, (2008); Veterinary Record **162**, 99-100; VLA Avian Disease Surveillance Report, Vol 12, N° 2, (April-June 2008). These episodes also clearly highlight the presence of this IBV variant within the poultry population. However, the extent of virus circulation is currently unquantified; hence the potential threat that this novel IBV variant may pose to the commercial poultry sector is unknown. Details of the previous two cases were summarised in the last quarterly report (Vol 12 N° 2 http://www.defra.gov.uk/vla/reports/docs/rep_survrep_qtlya0208.pdf).

The involvement of other variant IBVs was also indicated on three further occasions based on serology and clinical findings. Two small free-range layer flocks (190 and 400 birds each) reported an egg drop with egg quality, ill-thrift and mortality problems. The third incident involved 11-week-old free-range broilers. Ill-thrift, diarrhoea and respiratory signs were reported affecting 200 of 3,000 birds, and the presence of Marek's disease was also confirmed histologically.

GAME BIRDS

Staphylococcal tenosynovitis

Last year cases of tenosynovitis were reported in pheasant poults shortly after entry to release pens, apparently associated with the removal of plastic 'bits' prior to entry to the pen. *Staphylococcus aureus* was confirmed as the infectious agent in most cases (Quarterly report Vol 11 No 4, October-December 2007). This year further cases have been seen with a similar clinical history and presentation. However, in one case there appeared to be some brain involvement (with gliosis and foci of coccal-like bacteria within CNS blood vessels), and in another case granulomatous changes were found within the nasal chambers and *S. aureus* was isolated from the lesions.

It appears that damage to the nasal mucous membranes may occur if the bits are pulled out, rather than cut or snipped out, especially if the bits are made of hard plastic. The degree of nasal damage that may occur may merit further investigation if similar cases are recorded next year.

Adverse environment

The wet weather conditions that were prevalent throughout much of the summer had an adverse effect on young game birds. On one farm the loss of 100 nine-week-old pheasant poults in a flock of 800 was attributed to very poor condition and, in the absence of any lesions, considered to be caused by adverse environmental or nutritional factors. Recent heavy rainfall coinciding with release from the rearing pens was thought to be primarily responsible for the deaths of 500 out of 5,000 red-legged partridges that were not eating or drinking. The site manager, who had suspected this problem, increased the numbers of feeders and drinkers in the area and caught up and re-penned the weakest birds.

Mycotic pneumonia

An increase in diagnoses of fungal infections in pheasants this quarter compared to previous years was likely to be attributable to the wet conditions. In one report, aspergillosis was recognised as the likely cause of losses from granulomatous pneumonia and airsacculitis in two-week-old pheasant poults of which 175 out of 1,750 had been affected. White nodular lesions 1-2mm in diameter were detected in the lungs and air sacs of some birds submitted and the fungus was recovered on culture. *Mucor* spp. was responsible for mortality approaching 20% in pheasants aged three to five weeks in a multi-age rearing shed. Postmortem examination revealed evidence of airsacculitis, from which *Mucor* spp. were isolated. *Mucor* spp. were also isolated from feed, dust samples collected from the shed, and from dried vegetation outside the building. Histopathology subsequently confirmed that the airsac lesions were caused by *Mucor* spp., and although the lungs had appeared normal grossly, histopathology also revealed severe pulmonary pathology attributable to fungal infection.

Candidiasis

Candidiasis caused poor growth and increased mortality in a batch of 8-week-old red-legged partridges. Mucoïd intestinal contents, thickening of the crop and white debris in the infraorbital sinuses and choana were seen on postmortem. *Candida albicans* was isolated from the crop, intestines and sinuses.

Partridges appear to be susceptible to candidiasis, especially if environmental conditions deteriorate.

Trichomonosis

Postmortem examination of a captive capercaillie (*Tetrao urogallus*) revealed numerous areas of white caseous necrosis overlying areas of ulceration in the oropharynx and oesophagus. Large quantities of white caseous debris covered the mucosa of the crop and the wall of the proventriculus was thickened and contained several large white granulomata that extended into the deeper tissues. Histopathological examination subsequently demonstrated an extensive fibrino-granulocytic and ulcerative oesophagitis. Numerous protozoa consistent with *Trichomonas* species were associated with the oesophageal lesions.

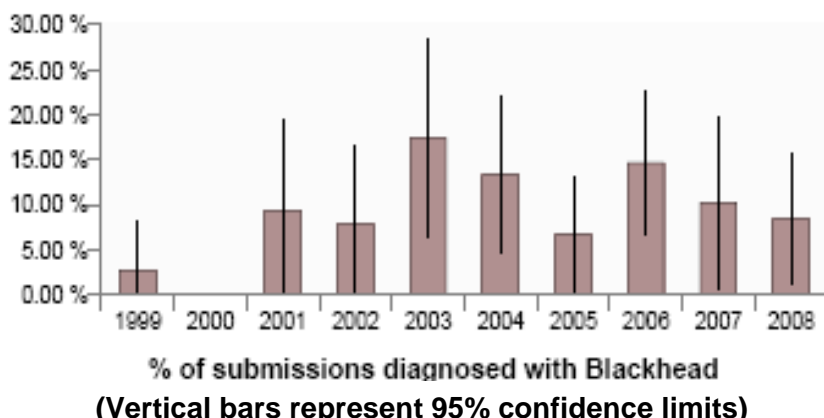
Trichomonosis of the upper digestive tract is well-recognised as causing deaths in garden birds (particularly finches), but we have previously been unaware of such severe lesions in game birds

MISCELLANEOUS AVIAN DISEASE TOPICS

Blackhead (histomonosis)

Fewer cases of blackhead were recorded in turkeys during the quarter than last year (Figure 10). However, in one flock 200 out of 700 birds were reported to have died and in another flock 20 out of 600 five-week-old organic turkey poults died and others appeared weak. There were also fewer VIDA records of blackhead in chickens than last year.

Figure 10. VIDA incidents of Blackhead in turkeys (as a percentage of diagnosable submissions) July – September 1999-2008



Fowl Cholera (*Pasteurella multocida*)

Three incidents of fowl cholera were recorded on VIDA during the quarter. In one of these swollen faces and a sudden mortality of 20 birds per day over a two day period was described in a group of 2,500 15-week-old turkey poults. Discolouration of the skin of the head with some subcutaneous oedema and swelling of the infra-orbital region along with conjunctivitis was seen. *Pasteurella multocida* was cultured from sinuses, lungs and airsacs of birds consistent with acute pasteurellosis. The rest of the birds responded well to parenteral penicillin.

Acute septicaemic conditions such pasteurellosis can be confused with avian notifiable diseases including avian influenza.

Marek's Disease

There was a small increase in VIDA diagnoses of Marek's disease in chickens compared with the same quarter of last year (Figure 11). Most of the recorded incidents were in hobby or backyard chickens, many of which are unvaccinated.

Figure 11. VIDA incidents of Marek's Disease in chickens (as a percentage of diagnosable submissions) July – September 1999-2008

