GB surveillance

Avian diseases

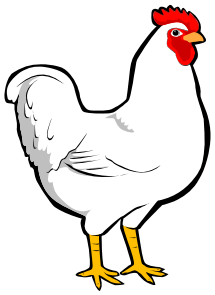
Veterinary Laboratories Agency

Working for public and animal health

SAC

Quarterly Report: Volume 13. No. 1

Date: January – March 2009



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 Aberdeen, Edinburgh, Inverness, St Boswells and Thurso Disease Surveillance Centres which comply with ISO 17025 standard.

Contents

Highlights

- **Isolation of H6N1 low pathogenicity avian influenza (LPAI) viruses confirmed following investigation of two turkey premises** - *The incursion of H6 viruses into domestic poultry occurs sporadically in the EU. Although this was a non-notifiable AI strain, the incident demonstrates the potential for the incursion and rapid spread of virus within and between flocks (page 5).*

- ***Erysipelothrix rhusiopathiae* septicaemia causing very high cumulative mortality was seen in free-range layers** - *There is currently no licenced vaccine for use in chickens in the UK (page 13).*

- **Atypical necrotic enteritis was diagnosed in commercial layers -** *This is an unusual manifestation of this condition (page 14).*

- **Severe gangrenous dermatitis causing sudden onset high mortality in broiler chickens, led to suspicion of notifiable disease** - *Classical lesions were present in all birds. Gangrenous dermatitis is now very uncommon in broiler chickens (page 14).*

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

Data extracted from the GB poultry register (GBPR).

NB: It is only mandatory for premises with 50 or more birds to register on the GBPR . Some premises with fewer birds have registered voluntarily but many will not be represented.

On the 01 January 2009, there were 17,072 premises holding a total of 238,764,225 birds.

Table 1. GB poultry demographics as of 01 Jan 2009

GBPR 01-Jan-09	England		Scotland		Wales		Total	
	Premises	Birds	Premises	Birds	Premises	Birds	Premises	Birds
Layers and layer breeders (chickens) (Premises with 50 or more birds)	4,503	29,815,799	364	6,176,187	325	1,257,653	5,193	37,249,639
Broilers and broilers breeders (chickens) (Premises with 50 or more birds)	1,775	112,935,417	198	13,013,868	129	7,341,785	2,103	133,291,070
Turkeys (Premises with 50 or more birds)	1,165	9,207,375	46	33,015	76	422,182	2,537	9,681,526
Ducks and geese (Premises with 50 or more birds)	2,290	6,239,362	297	220,529	153	81,424	2,740	6,541,315
Game birds* (Premises with 50 or more birds)	7,492	43,434,234	1,117	5,789,525	360	1,424,955	8,969	52,000,675
Total (Premises with 50 or more birds)	**14,498**	**201,632,187**	**1,710**	**25,233,124**	**864**	**10,527,999**	**17,072**	**238,764,225**
Flocks registered with GBPR with less than 50 birds	12,234	208,813	1,025	17,793	937	16,901	14,196	243,507

*Game birds = pheasants and partridges.

N.B. As of 01 Jan 2009, there were 15 poultry premises (50 or more birds), holding a total of 117,090 birds in the GBPR that had not been assigned to a country by the coordinates assigned by Radar.

- The sum of the premises column will not equal the total as some premises will have multiple species.
- Turkeys and game birds numbers alter by month. For these premises the GBPR requires that the number of birds entered on the form is the number of birds 'usually present on the premises'.
- Small flocks with fewer than 50 birds do not have to register with the GBPR, so "backyard" flocks are under-represented.
- Species not included in this report but registered on the GBPR are, Guinea Fowl, Quail, Pigeons reared for meat, Ostriches, Emus, Rheas, Cassowaries and Kiwis.

Figure 1A

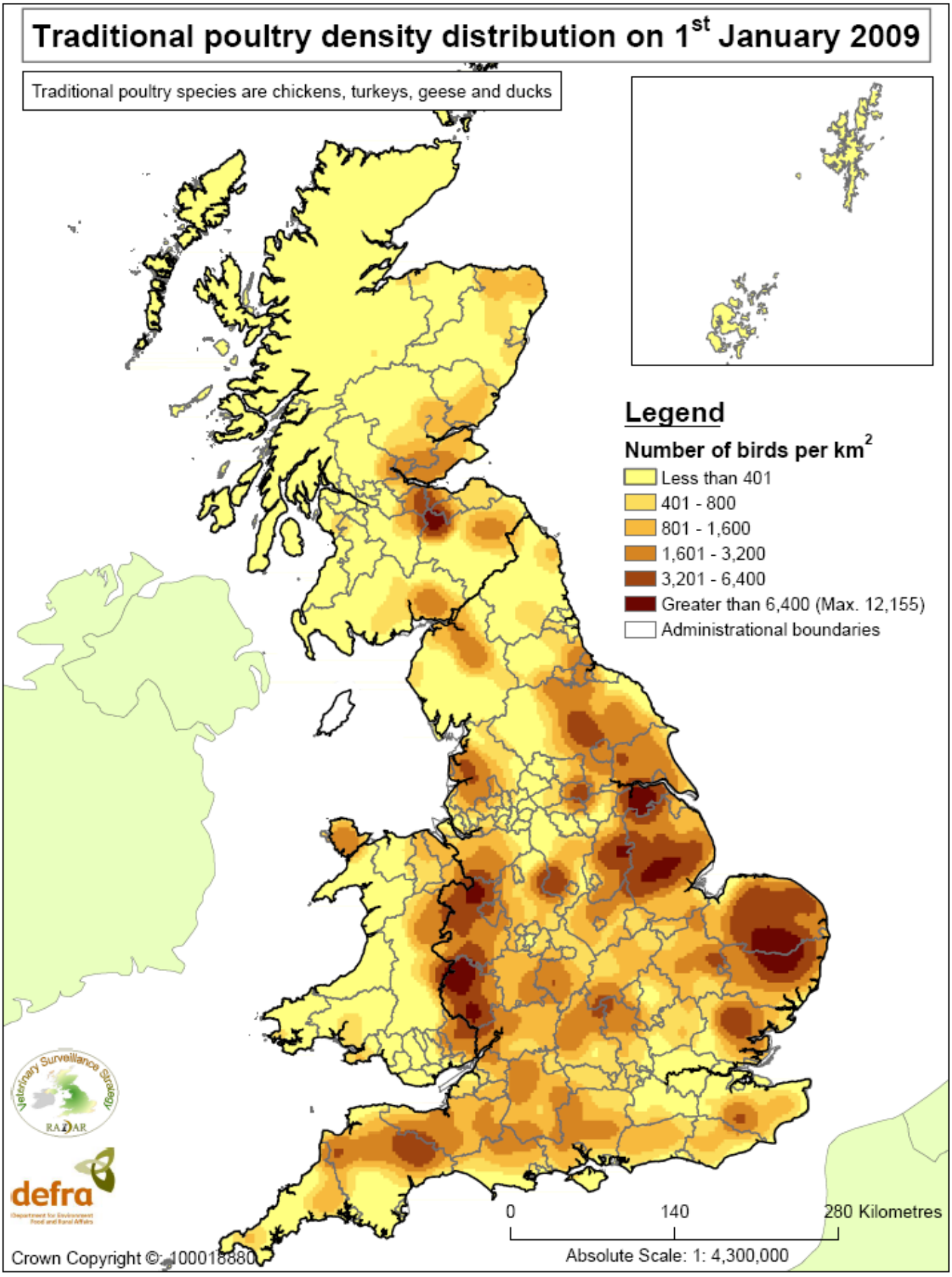
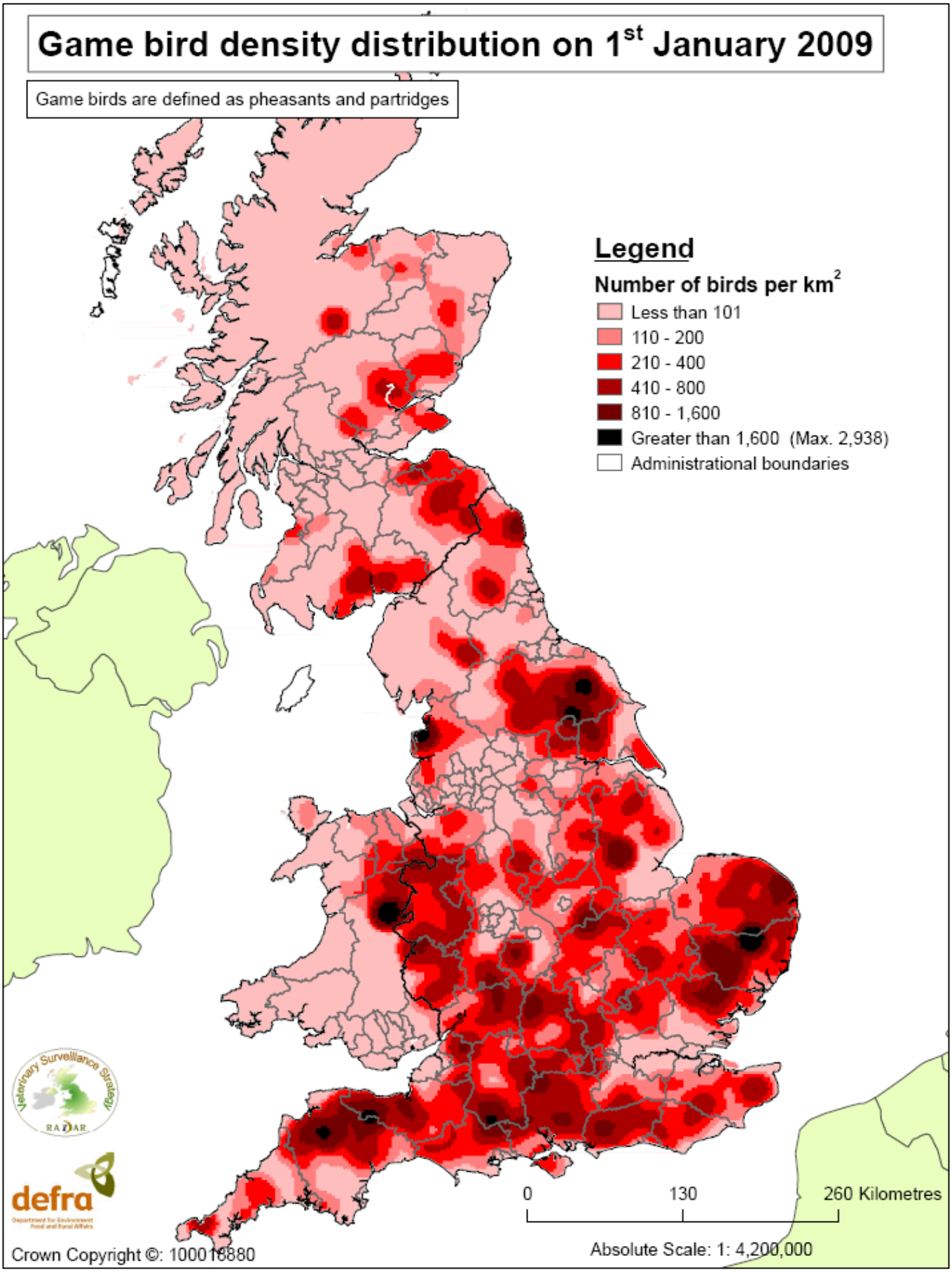

Traditional poultry density distribution on 1st January 2009
Traditional poultry species are chickens, turkeys, geese and ducks
Legend
Number of birds per km2
Less than 401
401 - 800
801 - 1,600
1,601 - 3,200
3,201 - 6,400
Greater than 6,400 (Max. 12,155)
Administrational boundaries
0
140
280 Kilometres
Absolute Scale: 1: 4,300,000
Crown Copyright © 100018880
Veterinary Surveillance Strategy
RADAR
defra

Figure 1B


Game bird density distribution on 1st January 2009
Game birds are defined as pheasants and partridges
Legend
Number of birds per km2
Less than 101
110 - 200
210 - 400
410 - 800
810 - 1,600
Greater than 1,600 (Max. 2,938)
Administrational boundaries
0
130
260 Kilometres
Absolute Scale: 1: 4,200,000
Crown Copyright ©: 100018880
defra

Economics of the Poultry Industry

1) Placings

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

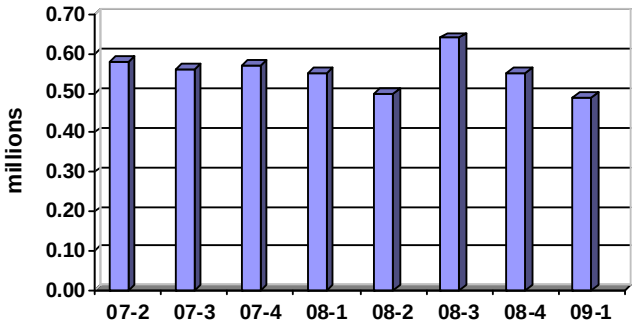


Figure 3. UK Quarterly figs for Commercial Layer Chick Placings (Average Monthly figures)

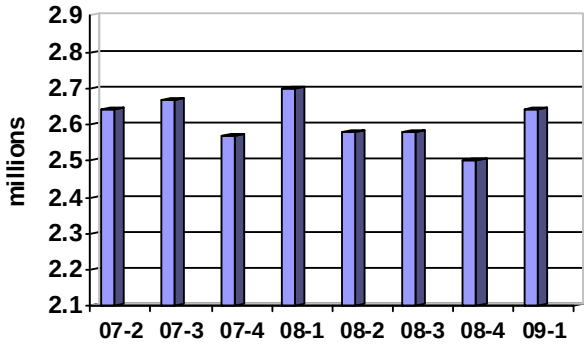


Figure 4. UK Quarterly figs for Commercial Broiler Chick Placings (Average Monthly figures)

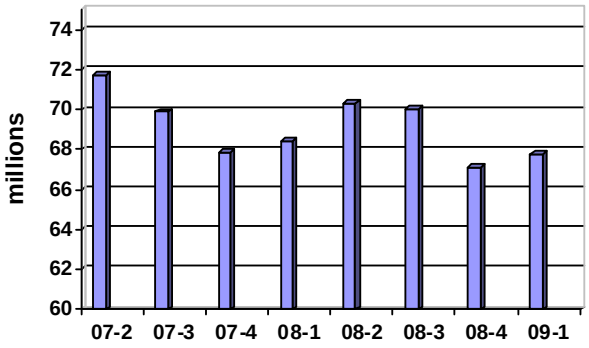


Figure 5. UK Quarterly figs for Turkey Poult Placings (Average Monthly figures)

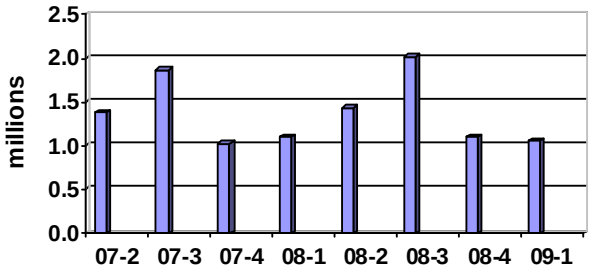


Figure 7. UK Quarterly figs for Broiler Slaughterings (Average monthly figures)

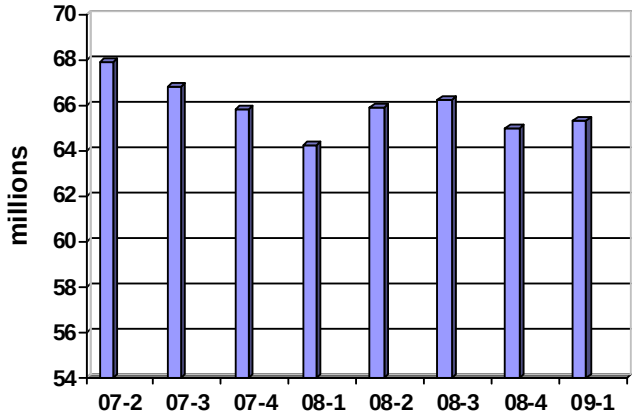
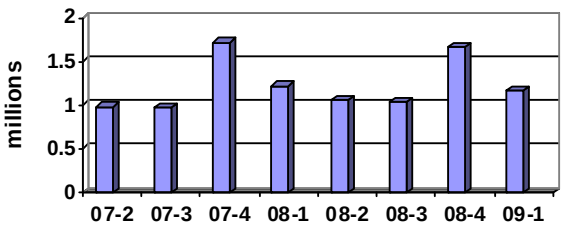


Figure 8. UK Quarterly figs for Turkey Slaughterings (Average monthly figures)



2) Slaughterings

Figure 8. Total UK Poultry Meat Production (Average Monthly Figures)

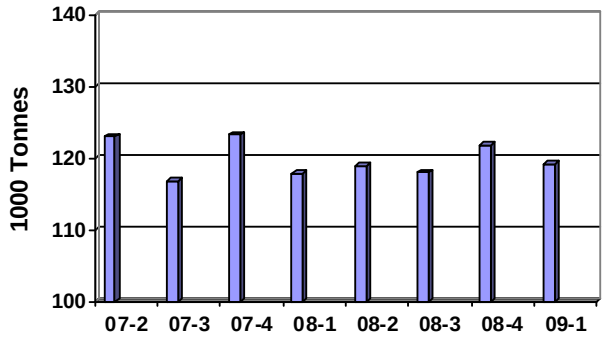
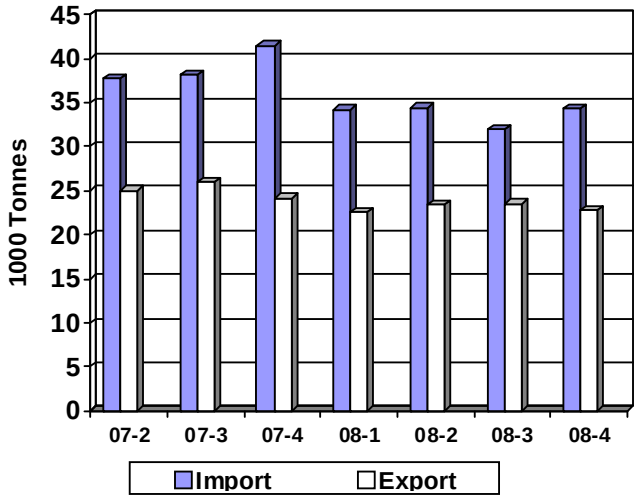


Figure 9. Total Poultry Meat Trade (Average Monthly figures) *



3) Meat production

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.

Weather and Climate

Temperatures were about 1°C below the monthly average (for 1971-2000) in England and Wales in January, but slightly higher than the average in Scotland. In February, temperatures were average for England and Wales, but slightly higher in Scotland, while in March temperatures were almost 1°C above average in all of Great Britain.

It was a very dry quarter in most of Great Britain with rainfall close to the monthly average in January, but well below it in February and March, especially in Wales, which received about 30% of its average rainfall in February. In March, the rainfall pattern was different in Scotland, where close to average rain fell, compared to about only 60% of average in February.

Submissions for scanning surveillance

Table 2. Poultry Diagnostic Submissions in GB – 1st Quarter

January – March	Submissions			Carcases		
	VLA	SAC	Total	VLA	SAC	Total
2009	301	40	341	649	106	755
2008	327	49	376	1127	150	1277
2007	412	33	445	1076	57	1133
2006	500	60	560	1342	53	1395
2005	304	41	345	784	78	862

The number of submissions, particularly carcase submissions, was lower than normal for this quarter. The reduction was mainly due to fewer broiler and layer submissions, although no reason is apparent.

NOTIFIABLE DISEASE – GREAT BRITAIN

Domestic poultry

No outbreaks of avian notifiable disease (AND) were confirmed during the quarter (January to March 2009) in Great Britain. Clinical material was however submitted to the National Reference Laboratory (NRL) for Avian Influenza (AI) and Newcastle Disease (ND), VLA Weybridge from four cases of suspected AND in domestic poultry. Two of these investigations were in turkey flocks (located in Norfolk and Suffolk), and two in chicken flocks (located in Kent and Gwent). In total, 200 samples were tested comprising sera (60), oropharyngeal swabs (60), cloacal swabs (60) and carcases (20). The isolation of H6N1 low pathogenicity avian influenza (LPAI) viruses was confirmed following investigation of the two turkey premises – further details of these cases are provided below.

H6N1 LPAI infection in turkey breeders - Case report

Introduction

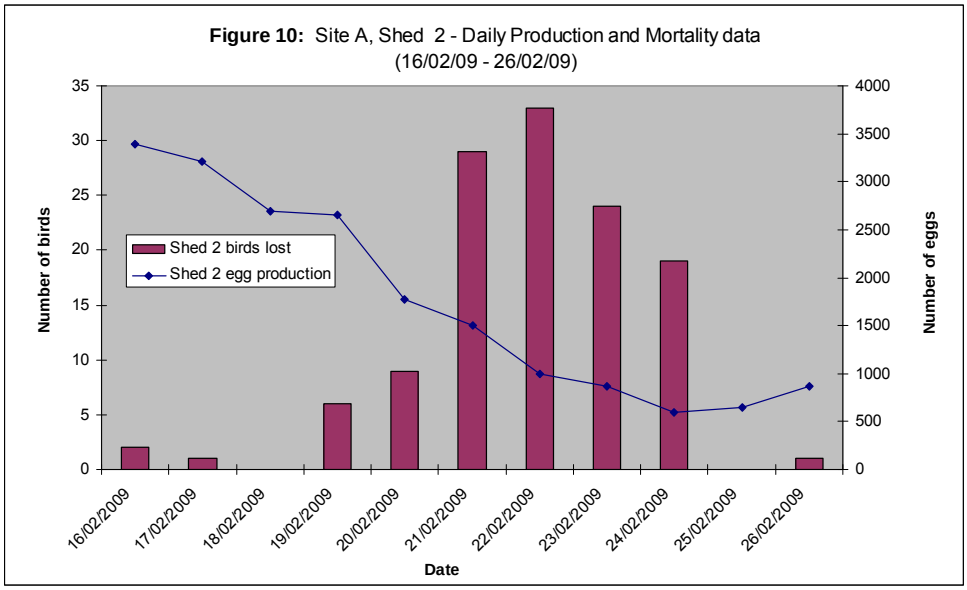
Disease associated with H6N1 LPAI infection was confirmed affecting two separate turkey breeder premises during February 2009. The diagnosis was made as a result of investigations that were initiated following the reported suspicion of AND affecting both premises. All of the birds at each site were housed in fully bird-proofed (netted) pole barns. The premises are both located in Eastern England, are shower in-shower out sites with strict biosecurity protocols, and are owned by the same company. No other company premises were affected.

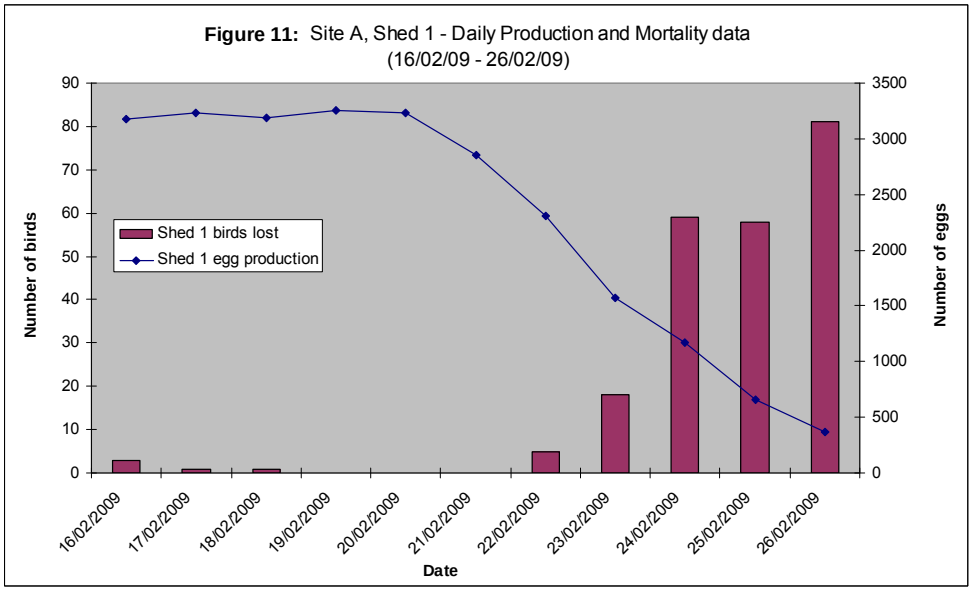
History & Clinical signs

At the time of initial AND investigations Site A comprised two turkey breeder flocks (Shed 1 and Shed 2) aged 50-weeks and 49-weeks-old respectively, with approximately 4,800 hens placed in each. Two further sheds of 250 stags each were also present. Site B comprised four turkey breeder flocks of approximately 2,500 hens each, aged 36-weeks, and two houses of some 500 stags. The duration and severity of disease was different on each premises, with recorded production losses and a more marked clinical presentation evident on Site A, approximately seven days before clinical signs were observed at Site B. The constellation of observed clinical signs at Site A, coupled with the appearance of similar disease signs on a second premises within a short time frame prompted the PVS to report suspected AND on 24 February 2009.

The pattern of the production losses in affected sheds at both sites was, however, broadly similar. Initially an egg drop was recorded, followed within 24-48 hours by the onset of mortality, with a rapid progression and resolution over a 7-10 day period. Clinically, within affected sheds at site A, the birds were also consistently described as being quieter, lethargic and coughing, with affected birds initially reported to be at one end only, with increasing morbidity, progressing as a wave of affected birds throughout the house over the subsequent 2-4 day period. Coughing was reported to typically resolve within 72 hours of onset. In addition to the recorded egg drops, loss of shell pigment was observed, with an increased number of floor eggs. Egg peritonitis and 'pneumonia' were observed at post-mortem examination of affected birds. At Site A, clinical signs were first evident in Shed 2 on 18 February 2009 (18% egg drop in 24 hours). Prior to this, bird losses were attributable to culls, and egg production had been consistent (mean daily production of 3,300 eggs). In Shed 1, the onset of clinical signs was reported to be on 21 February (11% egg drop in 24 hours). Figure 10 and Figure 11 show the daily egg drop and mortality data for Shed 2 and Shed 1 respectively.

At Site B, clinical signs were evident in Shed 5 only from 21 February (onset of mortality), with a 16% egg drop recorded by 24 February (previous mean daily production of 2,260 eggs). The overall severity and duration of production losses, clinical signs and mortality was much less at Site B (Figure 12).

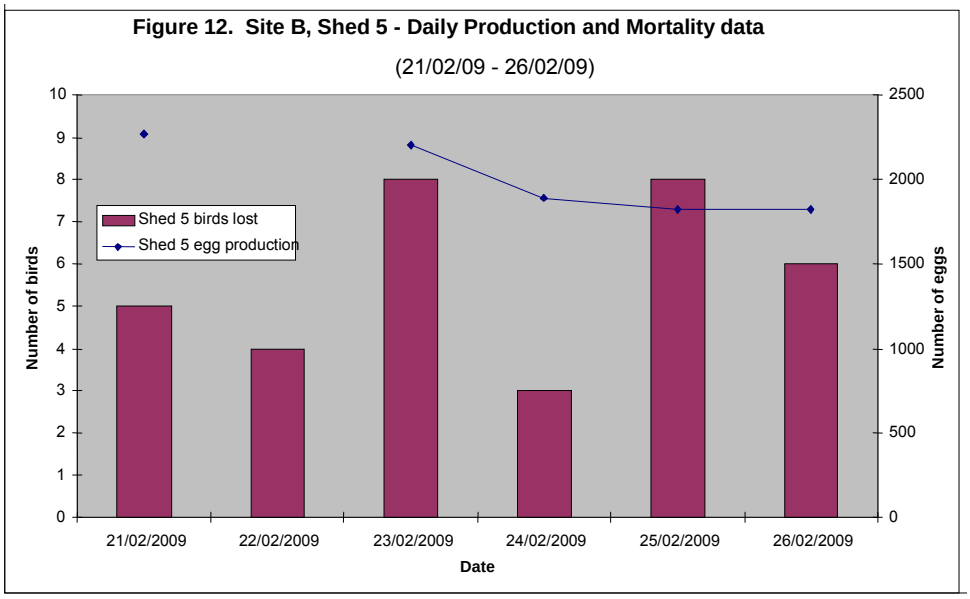




Laboratory Investigations

Samples comprising sera (40), oropharyngeal swabs (40), cloacal swabs (40) and carcases (8) were submitted to the NRL for AI and ND, VLA Weybridge from birds in the affected sheds at both premises. Results from the influenza A virus Matrix gene RRT-PCR (positive), and the H5 and H7 RRT-PCRs (both negative) were available within 12 hours of the start of testing (on 25 February), consistent with the presence of non-notifiable (non-H5, non-H7) influenza A virus infection. Virus isolation (in embryonated fowls' eggs) and further characterisation resulted in the identification of the H6N1 virus. Virus pathotype was confirmed as LPAI by intravenous pathogenicity index (IVPI) testing, resulting in the lifting of restrictions on both premises. No further statutory disease control measures were implemented.

In addition to the standard laboratory tests, results of initial genetic sequencing of the haemagglutinin (HA) gene of the H6 viruses isolated from both cases revealed 99% HA gene similarity, being most closely related to other contemporary European H6 viruses for which data is available. Furthermore, whole genome analysis revealed, for all gene segments, closest similarity to viruses circulating in wild birds and poultry in the EU. The genotype of the UK isolates was not consistent with those H6 strains that have been reported recently in Asia.



Summary & Conclusions

The incursion of H6 viruses into domestic poultry occurs sporadically in the EU. Detection is most frequent in turkeys, presumably as a result of increased susceptibility to AI viruses and evident clinical presentation, and ducks, possibly due to frequent contact with wild waterfowl in which H6 viruses are not uncommon. In GB from 2002-2008, eight H6 isolates were found through routine AIWBS activities. Whilst the source of the H6N1 LPAI virus was not definitively established, it is relevant that H6 isolates from both premises shared 99% HA gene similarity, indicating either secondary spread from an index premises (putatively Site A), or a shared, but unidentified, common source exposure of both sites. A linear distance of some 30 miles separated the two affected premises, and no other flocks of the same type within the company were affected. Furthermore, HA gene and whole genome sequencing analyses confirmed the virus to be most closely related to other known, contemporary, European H6 viruses of poultry and wild bird origin. Based on the exclusion of other relevant epidemiological factors, it is therefore tempting to speculate that the virus may have been of wild bird origin.

This episode also demonstrates a number of epidemiological features relevant to AI. Firstly, the potential for the incursion and rapid spread (both within and between flocks) of avian influenza viruses, and the requirement for high levels of on-farm hygiene and biosecurity measures to be maintained. Secondly, the overall pattern of disease was similar at both affected premises. However, the clinical signs, mortality and production losses were more severe in the older birds at Site A. Finally, the suspicion of AND was reported promptly by the PVS, enabling the rapid investigation and diagnosis of disease. The threat of incursion of avian influenza viruses remains, and vigilance for suspected clinical disease is advised.

Pigeon Paramyxovirus type 1 (PPMV-1) investigations

In total, six submissions relating to the investigation of five cases of suspected PPMV-1 infection in lofts of pigeons were received during the quarter. Four of the investigated cases were located in England (Essex, Hampshire, Hertfordshire, Suffolk). One of these four cases resulted in the submission of serum samples only (5), and positive haemagglutination inhibition (HI) test titres (≥ 2^4) were recorded for 4/5 serum samples (HI titre range $2^4 – 2^8$). Investigation of the other three suspected cases resulted in the submission of pigeon carcases, and samples were subject to attempted virus isolation. No other haemagglutinating virus) including PPMV-1, were detected. The fifth case was located in the Scottish Borders and resulted in laboratory testing of samples from two submissions (five sera and samples from pigeon carcases). Evidence of PPMV-1 infection was detected serologically (3/5 sera positive; HI titre range 2^4 - 2^7), and by virus isolation in embryonated fowls' eggs. Serology was completed on all blood samples according to the standard protocol (CEC, 1992).

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.

Reference

Commission of the European Communities [CEC], (1992). Council Directive 92/66/EEC of 14th July 1992 introducing Community measures for the control of Newcastle disease. Official Journal of the European Communities L260**,** 1-20.

Great Britain AI Wild Bird Surveillance (AIWBS)

H5N1 Highly Pathogenic Avian Influenza (HPAI) was not detected from any of the 923 wild birds sampled and tested during the last quarter in Great Britain. However, evidence of infection with other avian influenza (AI) viruses was detected from three wild birds that had been legally trapped and sampled. An H1N1 AI virus was detected from a Pintail (*Anas acuta*), and evidence of influenza A virus infection was detected from a Teal (*Anas crecca*) and one further Pintail (Table 2).

Table 3: Number of wild birds tested and results in GB - 1st Quarter.

Surveillance activity	Number of birds examined*	Positive AI virus result and species of bird	Comments
Legally trapped (ringing)†	809 *(840)*	H1N1, Pintail (*Anas acuta*) x1	Seasonal targeted surveillance.
Legally shot	Nil *(11)*	Nil	Surveillance activity ceased.
Found dead*	114 *(599)*	Nil	Scanning surveillance, all-year-round.

***** Number of birds examined: figures for January to March 2008 are shown in brackets.

† Of the Legally trapped bird samples tested, two further wild birds (one Teal, *Anas crecca*; one Pintail, *Anas acuta*) tested positive for influenza A virus infection by Matrix gene RRT-PCR. H5 RRT-PCR and virus isolation in embryonated fowls' eggs were negative for these birds.

Further information about H5N1 HPAI events in wild birds in Europe over the period January to March 2009 is summarised below (see 'International H5N1 HPAI Events'), and can also be found in the VLA Wildlife Disease Surveillance Report (Quarterly Report Vol. 10, No. 4), which can be found at: http://www.defra.gov.uk/vla/reports/rep_surv_wildlife.htm

INTERNATIONAL TRADE

A total of 51 submissions were received for the purposes of International Trade and health certification testing during the quarter.

Export: Domestic poultry & Captive birds

Sixteen submissions were received for testing for Export purposes (antigen detection) from a variety of avian species, including ducks, chickens, pigeons, African Grey parrots (*Psittacus erithacus*), Cockatiels (*Nymphicus hollandicus),* a Cockatoo (family *Cacatuidae*), Painted finches (*Emblema picta*) and Peales Parrot finches (*Erthura pealli*). Of these, fifteen submissions comprising a total of 544 swab samples (oropharyngeal or cloacal) were tested by influenza A Matrix gene RRT-PCR with negative results. One further submission of 174 cloacal swabs from pigeons was tested by virus isolation in embryonated fowls' eggs. No haemagglutinating viruses were detected. Countries to which the birds were being exported included Australia, Bermuda, South Africa and the United Arab Emirates.

Avian Influenza serology

A total of twenty submissions were tested for AI antibodies by AGIDT, comprising eighteen submissions totalling 3,028 chicken sera, one submission of one serum sample from a turkey, and one submission of 174 pigeon sera. Seronegative results were recorded for all 3,203 samples.

Avian paramyxovirus (APMV) serology

Samples from six submissions, totalling 179 sera, were tested for APMV-1/ND antibodies by HI test, all with negative results. One of these submissions comprised sera from pigeons (174), two were submissions of individual serum samples from Harris Hawks (*Parabuteo unicinctus*), and one serum sample was submitted from an unspecified hawk species, a cockatoo, and a Socorro dove (*Zenaida graysoni*) respectively.

Imported Captive birds in Quarantine

Eleven submissions were received from a variety of avian species including Peregrine Falcons (*Falco peregrinus*), Gyrfalcons (*Falco rusticolus*), fancy pigeons, chickens, Scarlet Ibis (*Eudocimus ruber*), Marabou storks (*Leptoptilos crumeniferus),* one Red Bird of Paradise (*Caesalpinia pulcherrima*), Tawny eagles (*Aquila rapax*) and Goldfinches (*Carduelis carduelis*). Samples from all of the birds apart from the latter two species were collected and tested as part of routine, statutory post-import/quarantine procedures. Countries of origin included Israel, Chad, Kuwait and the USA. The Tawny eagles and Goldfinches were seized at Heathrow airport and Stanstead airport respectively, with sampling conducted in quarantine following their attempted illegal importation. In total, 129 samples (including viscera, faeces, oropharyngeal swabs and cloacal swabs) were tested by virus isolation in embryonated fowls' eggs. No haemagglutinating viruses were detected.

AVIAN INFLUENZA - INTERNATIONAL DISEASE TRENDS

International H5N1 HPAI Events

During the first two months of 2009 there were no reported detections of H5N1 HPAI in Member States of the European Union (ADNS, 2009). However, during March H5N1 HPAI was detected from samples collected from a mallard duck (*Anas platyrhynchos*) that had been shot at Lake Starnberg, Bavaria, near Munich, Germany (OIE, 2009). The infected mallard duck was one of 39 wild birds that had been shot and sampled in January 2009. In total, the sampled birds comprised 35 mallards and four Canada geese (*Branta canadensis*); the samples from the other 38 wild birds were negative for influenza A virus infection.

The detection of H5N1 HPAI in wild bird species in Europe (2005 to date) has been most frequent from samples collected from wild birds found dead, and AI wild bird surveillance activities undertaken by EU Member States have shown that swans have been a key species in this regard (Hesterberg *et al.*, 2009).

Several other wild bird species have also been involved in wild bird mortality incidents associated with the detection of H5N1 HPAI in different EU Member States, predominately various wild waterfowl species (ADNS, 2006; ADNS, 2007). In comparison, the detection of H5N1 HPAI from so-called 'healthy' wild birds in Europe has been much less common, with the most recent prior detection having been from a pochard (*Aythya ferina*) trapped and sampled on Lake Sempach in Switzerland in February 2008 (OIE, 2008). Globally, there have been other sporadic detections of H5N1 HPAI from 'healthy' wild birds species reported (includes: Chen *et al.*, 2006; Lvov *et al.*, 2006; Minta *et al.*, 2006), largely from regions where disease has been previously detected and/or established.

During January 2009, Nepal reported their first outbreak of H5N1 HPAI in backyard poultry, following the submission of samples and confirmatory testing at the EU/OIE/FAO World Reference Laboratory for AI and ND, VLA Weybridge. A further outbreak in backyard poultry was confirmed during February. Reports of H5N1 HPAI outbreaks in poultry have continued from areas where infection is long established and/or recognised to be endemic, including Bangladesh, Egypt, India, Indonesia, Laos and Vietnam. In addition, China and Hong Kong SAR confirmed disease in poultry, wild waterfowl and other wild bird species. Human cases and deaths attributable to H5N1 infection also continue to occur in some of these countries, sometimes in advance or in the absence of confirmed disease in linked, contact poultry populations (OIE, 2009b; UNFAO, 2009).

Other International NAI Events

Within the EU, several Member States reported outbreaks of H5 or H7 LPAI in domestic poultry that were mostly detected as a result of AI surveillance activities. Following on from the confirmed outbreaks in December 2008, Germany reported further outbreaks of H5N3 LPAI in Lower Saxony during January and February 2009. In total, 33 poultry premises were infected, the vast majority being turkey premises (32), with one mixed poultry species premises. Approximately 610,000 birds were culled (EUROPA, 2009a). France reported two outbreaks of H5N3 LPAI in domestic ducks in Vendee region, Poland reported one outbreak of H5 LPAI in turkeys, and the Czech Republic reported an H7N9 LPAI outbreak in a breeder goose flock (EUROPA, 2009b). These events all serve as a reminder of the threat of occasional incursion of H5 and H7 LPAI viruses into poultry, presumably of wild waterfowl origin, with the risk of more extensive secondary spread in areas of higher poultry population density. Outbreaks of notifiable LPAI (due to infections with AI viruses of H5 or H7 subtypes) were also reported from North America and the Far East during the quarter.

References

ADNS, (2006). Highly Pathogenic Avian Influenza (HPAI) Cases in Wild Birds in 2006 Notified by Member States to the Animal Disease Notification System (ADNS). http://ec.europa.eu/food/animal/diseases/adns/adns_wildbirds2006.pdf

ADNS, (2007). Highly Pathogenic Avian Influenza (HPAI) Cases in Wild Birds in 2007 Notified by Member States to the Animal Disease Notification System (ADNS). http://ec.europa.eu/food/animal/diseases/adns/adns_wildbirds2007.pdf

ADNS, (2009). Highly Pathogenic Avian Influenza (HPAI) Cases in Wild Birds in 2009 Notified by Member States to the Animal Disease Notification System (ADNS). http://ec.europa.eu/food/animal/diseases/adns/adns_wildbirds2009.pdf

Chen, H., Smith, G.J., Li, K.S., Wang, J., Fan, X.H., Rayner, J.M., Vijaykrishna, D., Zhang, J.X., Zhang, L.J., Guo, C.T., Cheung, C.L., Xu, K.M., Duan, L., Huang, K., Qin, K, Leung, Y.H., Wu, W.L., Lu, H.R., Chen, Y, Xia, N.S., Naipospos, T.S., Yuen, K.Y., Hassan, S.S., Bahri, S., Nguyen, T.D., Webster, R.G., Peiris, J.S. & Guan, Y. (2006). Establishment of multiple sublineages of H5N1 influenza virus in Asia: implications for pandemic control. *Proc. Natl. Acad. Sci. USA*. 103(8):2845-50.

EUROPA, (2009a). Standing Committee on the Food Chain and Animal Health (SCoFCAH), Animal Health & Animal Welfare – Presentations: Low Pathogenic Avian Influenza in Germany – Current situation (SCOFCAH, Brussels, 3-4 March 2009). http://ec.europa.eu/food/committees/regulatory/scfcah/animal_health/presentations/ai_34032009_de.pdf

EUROPA, (2009b). Standing Committee on the Food Chain and Animal Health (SCoFCAH), Animal Health & Animal Welfare – Presentations. http://ec.europa.eu/food/committees/regulatory/scfcah/animal_health/presentations_en.htm#34022009

Hesterberg, U., Harris, K., Stroud, S., Guberti, V., Busani, L., Pittman, M., Piazza, V., Cook, A., & I. H. Brown (2009). Avian influenza surveillance in wild birds in the European Union in 2006. Influenza and Other Respiratory Viruses 3(1), 1–14.

Lvov, D.K., Schelkanov, M.I.U., Deriabin, P.G., Grebennikova, T.V., Prilipov, A.G., Nepoklonov, Y.A., Onishchenko, G.G., Vlasov, N.A., Aliper, T.I., Zaberezhnyi, A.D., Kireyev, Y.D., Krasheninnikov. O.P., Kiryukhin, S.T., Burtseva, Y. I. & Slepushkin, A.N. (2006). Isolation of influenza A/H5N1 virus strains from poultry and wild birds in west Siberia during epizootic (July 2005) and their depositing to the state collection of viruses (August 2005). [In Russian]. *Vopr. Virusol.* 51:11-14.

Minta, Z., Smietanka K., Domanska-Blicharz, K., Tomczyk, G., & Wijaszka, T. (2006). HPAI H5N1 infection of a Mute Swan flock in the city of Toruń in Poland. Joint Twelfth Annual Meeting of the National Laboratories for Newcastle Disease and Avian Influenza of European Union Member States 2006. http://ec.europa.eu/food/animal/diseases/controlmeasures/avian/docs/pres6_jam2006.pdf

OIE, (2008). Immediate notification report. Report reference: Ref OIE: 6917, Report Date: 31/03/2008, Country: Switzerland. http://www.oie.int/wahis/reports/en_imm_0000006917_20080331_092338.pdf

OIE, (2009a). Immediate notification (Final report) - Highly pathogenic avian influenza, Germany. http://www.oie.int/wahis/public.php?page=single_report&pop=1&reportid=7874

OIE, (2009b). Facts & Figures: Avian Influenza - H5N1 notified in 2009. http://www.oie.int/Eng/info_ev/en_AI_factoids_1.htm (updated 11 March 2009; accessed 05 May 2009).

UNFAO, (2009). FAOAIDEnews - Avian Influenza Disease Emergency, Situation Update 58 (15 March 2009). ftp://ftp.fao.org/docrep/fao/011/ai338e/ai338e00.pdf

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 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 4. Farm Investigation and Advisory Visits – 1st Quarter

January – March	England Wales	Scotland	Total Visits
2009	9	0	9
2008	6	N/A	N/A
2007	15	N/A	N/A
2006	7	N/A	N/A
2005	10	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.gov.uk/vla/reports/rep_food.htm

Table 5. Food Safety Incidents – 1st Quarter

January – March	England Wales	Scotland	Total Incidents
2009	0	1	1
2008	0	N/A	N/A
2007	0	N/A	N/A
2006	2	N/A	N/A
2005	0	N/A	N/A

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

The annual number of incidents of *S.* Enteritidis and *S.* Typhimurium in turkeys is shown in Table 5 below, and of *S.* Binza and *S.* Orion in pheasants in Table 6. In both of these tables the figures for 2009 (1st Quarter) are provisional.

Table 6. The annual incidents of *S.* Enteritidis and *S.* Typhimurium in turkeys

	2005	2006	2007	2008	2009 (Q1)
Enteritidis (total)	0	0	0	0	0
Typhimurium (total)	23	38	12	1	0

Note: The incidents of *S.* Enteriditis 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 7. The annual incidents of *S.* Binza and *S.* Orion in pheasants

	2005	2006	2007	2008	2009 (Q1
Binza (total)	10	21	7	6	0
Orion (total)	3	3	2	2	0

CROSS-SECTOR AVIAN DISEASES

Blackhead (histomonosis)

No incidents of blackhead were recorded on VIDA in chickens and turkeys during the quarter. However there was an anecdotal report of an outbreak in a housed turkey breeder flock where the means of entry was considered likely to have been contaminated clothing or footwear.

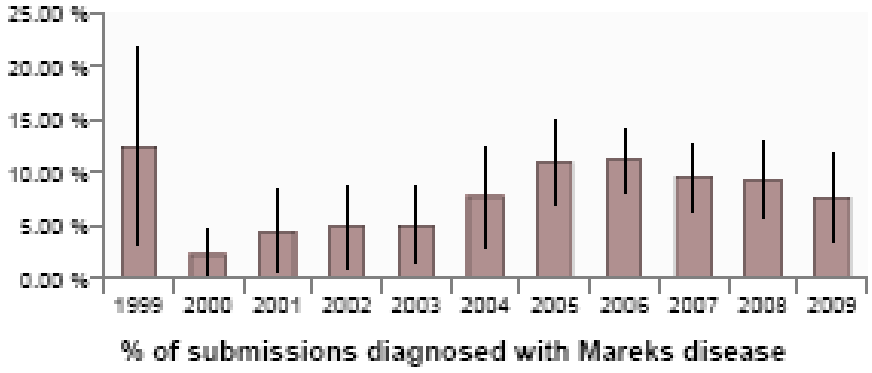
Fowl Cholera (*Pasteurella multocida*)

No incidents of fowl cholera (*Pasteurella multocida*) were recorded on VIDA in chickens or turkeys during the quarter.

Marek's Disease

The gradual decline in the number of incidents of Marek's disease recorded on VIDA continued during the quarter (Fig 13). Among the incidents recorded in small backyard or hobby flocks was a case in a 6-month-old light Sussex chicken which showed a typical clinical presentation of leg paralysis on one side, and post-mortem examination confirmed gross enlargement of the sciatic nerve on the same side, but there was also marked thickening of the caecal wall and tumour-like lesions in the lungs. Changes typical of Marek's disease were demonstrated by histopathology in all three tissues. The combination of both nerve enlargement (the 'classic' form of the disease) and visceral tumours (the 'acute' form of the disease) was unusual, and the location of the lesions in the lungs and caecal wall was also unusual. The bird had not been vaccinated against Marek's disease.

Figure 13: VIDA incidents of Marek's disease in chickens (as a percentage of diagnosable submissions) January – March 1999 - 2009



(Vertical bars represent 95%confidence limits)

ENDEMIC DISEASE SURVEILLANCE

COMMERICIAL LAYERS AND LAYER BREEDERS

Erysipelas

Further cases of erysipelas (*Erysipelothrix rhusiopathiae* septicaemia) causing prolonged moderately elevated mortality, and resulting in very high cumulative mortality, were seen in three flocks of organic free range layers aged 40, 65 and 76 weeks in different parts of the country (see Quarterly Report October-December 2008, page 15).

Poultry farmers and their veterinary surgeons should be reminded of the zoonotic potential of *E. rhusiopathiae* and should take suitable precautions when handling potentially infected carcases for disposal by incineration or for post-mortem examination. These would include the wearing of disposable waterproof gloves, thorough handwashing afterwards, and as much as possible the avoidance of handling carcases by persons with cuts or abrasions on their hands or arms.

Necrotic enteritis

An unusual case of necrotic enteritis was diagnosed in a flock of 10000, 29-week-old free-range layers with a history of sudden slight increase in mortality. Typical lesions were found in two of the three birds submitted for post-mortem examination and involved almost the entire intestinal tract, sparing a small section around Meckel's diverticulum. Lesions were confirmed histologically as large areas of coagulative necrosis in which there were numerous colonies of large Gram positive bacilli. Necrotic enteritis in layers in general, and in birds in lay in particular, is very unusual. In broiler chickens of around 2 to 4 weeks of age, where the condition occurs most commonly, there is sometimes an association between coccidial infection and necrotic enteritis. Coccidiosis is occasionally seen in layers in the early part of lay, although no evidence of it was found in these birds. No possible predisposing factors were discovered in this case.

It is unusual for necrotic enteritis to occur in layer chickens in lay. This fact together with the absence of the usual predisposing factors indicates that further monitoring is indicated should further cases occur.

BROILERS AND BROILER BREEDERS

Submissions of batches of broiler chickens for post mortem examination were slightly fewer than usual for this quarter than in recent years. Mostly they were of common conditions such as navel and yolk sac infection and *E. coli* infections including chronic polyserositis, abdominal cellulitis and septic arthritis. Two cases of suspected "spiking mortality" (probable hypoglycaemia) were seen in 25- and 28-day-old flocks and birds from two other flocks showing unevenness and stunting were examined (discussed in detail in Quarterly Report July-September 2008, page 11). There were also histopathology submissions from poultry practitioners from episodes of probable "spiking mortality".

Chronic spondylitis

Enterococcus cecorum was isolated from spinal lesions in 41-day-old birds with chronic spondylitis ("spinal abscess"), a condition which appears to have declined markedly since it became very common for a period of a few years around 6 or 7 years ago (Wood and others, 2002, Isolation of *Enterococcus cecorum* from bone lesions in broiler chickens, Veterinary Record, **150**, 27).

Gangrenous dermatitis

A severe episode of gangrenous dermatitis, a condition now very uncommon in broiler chickens, was seen in February. Two houses of approximately 30,000 thirty-day-old birds showed a sudden onset of high mortality, with up to 1400 dead on two consecutive days in one house. The two affected houses were from a common source and two other unaffected houses on-site were of a different breed, and from different parent flocks in a completely different location. Classical lesions of gangrenous dermatitis were present in all birds examined and staphylococci and *Clostridium septicum* were isolated from lesions. This condition is thought to be commoner in immunosuppressed birds, particularly those derived from parent flocks not vaccinated for chick anaemia virus (CAV) and which become infected once in lay. The CAV vaccinal status of the parents of the affected flocks was in doubt but could not be ascertained. Birds examined at post-mortem had chronic bursal atrophy. Animal Health was notified, but avian notifiable disease was excluded.

There were very few submission of Broiler Breeders this quarter. A further case of traumatic Achilles tendon rupture in females in the early part of lay was seen (see Quarterly Report October-December 2008, page 16). *Enterococcus hirae*-associated encephalomalacia was diagnosed in 6-day-old parent

stock chicks. This condition occurs between day 3 and day 8 and is not uncommon in broiler chicks, less so in layer pullets, and is unusual in broiler breeders.

TURKEYS

Wet litter problem

An episode of "wet litter" occurred in a group of 5,000 seven-week-old turkey poults. Huddling and ruffled feathers were described and approximately 20% of the birds were affected. Two birds submitted live had relatively little food in the crops and gizzards and large intestinal contents were described as undigested. Lesions of acute mild enteritis/typhlitis were non-specific. Rotavirus was detected in intestinal contents of one of the two birds. No significant bacteria were isolated from these two birds nor spirochaetes cultured anaerobically. Avian metapneumovirus has been associated with wet litter. In this case, sera from the two live birds was negative on ELISA testing for antibodies to this agent.

For Defra only

Wet litter has been recognised as a problem in turkey poults for a number of years. Work in the USA suggests that there may be enteric viruses involved in poult enteritis complex and poult enteritis/mortality. These include astroviruses, coronaviruses, reoviruses, rotaviruses and parvoviruses. Molecular methods to detect these agents are increasingly being used as many enteroviruses can be difficult to isolate. Sequencing may also give useful information particularly where there may be strain variations in pathogenicity e.g. reovirus and adenovirus. There may be a place to develop multiplex or microarray systems to help in diagnosis of these conditions which have quite a probable economic impact. Recent references on some of these conditions are:

Partial genome sequence analysis of parvoviruses associated with enteric disease in poultry L.Zsak,K.O.Strother and J.Kisary, (2008) Avian Pathology, **37(4),** 435-441.

Development of a Polymerase Chain reaction Procedure for Detection of Chicken and Turkey Parvoviruses, L.Zsak *et al.*, (2009), Avian Diseases, **53,** 83-88.

Detection of a coronavirus from turkey poults in Europe genetically related to infectious bronchitis virus of chickens. D.Cavanagh, K.Mawditt, M.Sharma, S.E.Drury, H.L.Ainsworth, P.Britten and R.E.Gough, (2001), Avian Pathology, **30**, 355-368.

In the same quarter, rotavirus was confirmed in a faecal sample from a two and a half week old turkey poult. The clinical history indicated high mortality in young turkeys with vocalisation and severe typhlitis.

DUCKS AND GEESE

Botulism was suspected, although not proven, in an incident of weakness and death described in ornamental ducks. Eight out of thirty ducks died in a group kept outside in a caged duck pond. Clinical signs consisted of a progressive weakness over a period of several days leading to death. Birds had difficulty walking and flying and wing drooping was described. Although there was no obvious source of botulinum toxin, it was suggested that carcases of previously dead birds in the past may have sunk to the bottom of the pond.

Aeromonas hydrophila/caviae and *Pseudomonas aeruginosa* were isolated from the carcase of a goose which died suddenly. Gross lesions included perihepatitis, peritonitis and pericarditis with splenomegaly and the bacteria isolated were in septicaemic distribution. It was the only bird affected in a group of 30 birds. *P.aeruginosa* can be a pathogen of poultry (e.g. associated with yolk sac infections in hatcheries with contaminated water). It is generally thought to be opportunistic in nature. *A.hydrophila* has been isolated in both local and septicaemic infections in birds, particularly ducks.

BACKYARD FLOCKS

Concerns regarding biosecurity in the backyard flock sector were illustrated by the following disease outbreaks.

One hen from a group of 15 was presented for post-mortem examination with a three-day history of disorientation, anorexia, yellow diarrhoea, cyanosis of the comb and head twitching. All the remaining birds in the group were reported to have cyanosis of the comb and anorexia. There was a history on the premises of "rescue" birds being introduced and there was recent contact with a premises where there were a number of chickens from different sources. Avian notifiable disease was considered a possibility and investigations were immediately made to rule this out. Egg peritonitis was found to be the cause of death in the bird presented.

On a second premises a new cockerel was introduced to a small flock of 50 chickens and eight days later respiratory signs began to be seen in the group. Infectious laryngotracheitis (ILT) was confirmed in one of the birds that died. This disease, caused by herpes virus, is often seen after being introduced to susceptible flocks with the introduction of purchased birds. Purchased birds can appear healthy, but may be carriers of the virus.

The owners were given appropriate advice about the risk of introducing infectious diseases.

GAME BIRDS

There were very few game bird submissions in the quarter, as few disease problems are generally recognised during the over-wintering period, prior to the start of the breeding season. However, two diagnoses were of note. The first was a report of heavy infestations with the louse *Menacanthus stramineus*. This is the most pathogenic louse of poultry and can also occur on pheasants. Like other louse species, heavy infestations often occur concurrently with debilitating problems such as internal parasitism and poor nutrition, particularly during winter.

The second diagnosis of note was of the caecal worm *Heterakis isolonche* in an ornamental pheasant that had died. Although formerly well recognised in pheasants, *H. isolonche* is now rarely recorded, probably as a result of the widespread use of anthelminthics. It causes severe disease in the caecum and is much more pathogenic than the more widespread caecal worm, *H. gallinarum*, which parasitises a wider range of host species and is generally associated with few clinical signs. Although *H. isolonche* responds well to anthelminthic treatment in the bird, the eggs can remain viable in the soil for a year and there is therefore the risk of reinfection in birds using the same ground.