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Programmes for the eradication, control and monitoring of certain animal diseases and zoonoses

Survey programme for Avian Influenza (AI)

Approved* for 2012 by Commission Decision 2011/807/EU

United Kingdom

* in accordance with Council Decision 2009/470/EC

Standard requirements for the submission of national surveillance programmes for avian influenza in poultry and wild birds as referred to in Article 1(d) of Commission Decision 2008/425/EC

1. Identification of the programme

Member State:	United Kingdom
Disease:	Avian Influenza (AI)
Year of implementation:	2012
Reference of this document:	UK AI Survey Plan 2012
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Date sent to the Commission:	29 April 2011

2. Description of the surveillance programme in poultry

The UK poultry survey for avian influenza (AI) viruses of subtype H5 and H7 is a risk-based, targeted serological survey based on the provisions of and criteria and guidelines in Commission Decision 2010/367/EU. As such, the risk-based surveillance (RBS) approach represents an active surveillance framework that complements existing early detection - passive surveillance - systems for detection of avian notifiable disease in domestic poultry[1] [2]. It is also relevant to note that scanning surveillance approaches may be less sensitive for detecting AI in ducks and geese (anseriformes) compared to other domestic poultry such as turkeys and chickens (galliformes).

The choice of RBS approach has been determined by assessment at Member State level of criteria and risk factors listed in Section 4.1 of Decision 2010/367/EU. This includes consideration of relevant risk pathways for infection of poultry flocks (incursion and secondary spread) in the UK, specifically:

(i) Direct or indirect contact with wild birds, particularly migratory species of waterfowl;

[1] For example, Article 2 of Commission Decision 2005/734/EC of 19 October 2005 laying down biosecurity measures to reduce the risk of transmission of highly pathogenic avian influenza caused by Influenza virus A subtype H5N1 from birds living in the wild to poultry and other captive birds and providing for an early detection system in areas at particular risk: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2005:274:0105:0107:EN:PDF

[2] Chapter II(2) of the Annex to Commission Decision 2006/437/EC of 4 August 2006 approving a Diagnostic Manual for avian influenza as provided for in Council Directive 2005/94/EC: http://eur-lex.europa.eu/LexUriServ/site/en/oj/2006/l_237/l_23720060831en00010027.pdf

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(ii) Direct or indirect contact with infected poultry;
(iii) Between flock movements of poultry, poultry products, personnel and fomites.

Therefore, the RBS approach comprises sampling targeted towards those poultry holdings in the UK considered to be at greater risk of infection with AI with regard to the risk pathways outlined above, available data and with exclusion of specified poultry production types on the basis of perceived risk of infection with AI – see sections 2.2.1 to 2.2.5 below.

Serum samples are screened for the presence of antibodies to avian influenza viruses of subtypes H5 and H7. Following a positive serological result, movement restrictions are served on the premises and further field and laboratory investigations are carried out to establish whether active infection is present or not.

2.1 Objectives, general requirements and criteria

The objectives of the avian influenza RBS in domestic poultry are to:

- Detect LPAI of subtypes H5 and H7 in galliformes or anseriformes birds;
- Detect LPAI of subtypes H5 and H7 and highly pathogenic avian influenza (HPAI) in domestic waterfowl;
- To target this surveillance at higher risk poultry populations, relating to specified risk factors – see below.

2.2 Risk-based survey design and implementation

2.2.1 Survey design. Briefly, the design of the UK RBS approach for the AI poultry survey comprises five parts:

1. **Analysis of existing guidelines and datasets:** Analysis of criteria and risk factors listed in Section 4.1 of Commission Decision 2010/367/EU with reference to available national poultry population data sources, specifically the Great Britain Poultry Register (GBPR) and the Northern Ireland (NI) poultry register, and relevant risk factors and risk pathways.

2. **Risk matrix:** Development of a risk matrix relevant to a UK RBS plan for the AI poultry survey. Following part 1 analyses, four specific risk factors were identified for inclusion in the risk matrix, as follows:

   (i) Location of poultry holdings, incorporating a risk-based analysis that describes high priority surveillance counties, or so-called Blue Counties - BC - that were derived by identifying:

      (a) Areas where commercial poultry are at greatest risk of an incursion of AI virus from wild birds;
      (b) Areas in which specified wild bird species (n=24) of the orders *Anseriforme* (ducks, geese, swans) and *Charadiforme* (gulls, terns, waders) are most abundant;
      (c) County areas in which the first two factors coincide or overlap.

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A map showing the high priority surveillance counties - or 'Blue Counties'[3] - of Great Britain is available at: http://archive.defra.gov.uk/foodfarm/farmanimal/diseases/atoz/ai/wildbirds/surveymap.htm. In NI, all counties are 'Blue Counties'.

(ii) Water body on the poultry premises – WB.
(iii) Mixed poultry species holding, where one of the poultry species is waterfowl – MSW.
(iv) Free-range (or equivalent management system) – FR.

3. **Estimate of the numbers of holdings required for survey selection and recruitment:** The numbers of holdings for each poultry production category available for selection and recruitment by AH field staff during the 2010 AI poultry survey were compared to the number of holdings sampled. Hence, an estimate of the numbers of poultry holdings required for the 2012 survey can be derived.

4. **Exclusion criteria:** Justifications for the omission of certain poultry production types on the basis of perceived risk of infection with AI (in line with the provisions of Decision 2010/367/EU). The criteria and associated rationale were derived from expert opinion and are described more fully in section 2.2.4 below.

5. **Sampling frame:** Integration of the combined outputs from parts 1-4 above to develop a proposed sampling frame for 2012 AI poultry survey in UK. Further details are also provided in sections 2.2.2 to 2.2.5 below.

The following types of poultry are included in the survey:

- Domestic chickens - layer flocks, including free-range. Breeder flocks are subject to exclusion criteria (see section 2.2.4 below). Broilers are not included.
- Turkeys - fattener (meat type) flocks. Breeder flocks are subject to exclusion criteria (see section 2.2.4 below).

[3] The design of the RBS approach for the UK AI poultry survey describes so-called Blue Counties of Great Britain (GB), after Snow *et al*, (2007). Risk-based surveillance for H5N1 avian influenza virus in wild birds in Great Britain. Veterinary Record, 161, 775-781: http://veterinaryrecord.bmj.com/content/161/23/775.full.pdf.

The high priority surveillance counties - or 'Blue Counties' - of GB are defined as follows (Snow *et al*, 2007. Veterinary Record, 161, 775-781):

"A single map showing priority areas for surveillance was constructed by calculating the product of the score of wild bird abundance and the score for poultry risk in each 10 km square. The scores were then categorised to give ranks from 1 to 6, with a rank of 6 indicating that there were either no poultry or no wild birds present in the 10 km square, and the ranks from 5 to 1 indicating risks in increasing order of priority for surveillance.

All the 10 km squares in the top rank, that is, approximately the top 20 per cent of the scored squares, are defined as priority squares for surveillance. Such squares combine a high abundance score for the 24 wild bird species of interest and high densities of higher-risk poultry holdings.

To create county level maps, incursion scores were calculated for each county as the average score for all 10km squares with any land within the county boundary i.e. if a square falls on the boundary between two counties it is counted twice.

In consultation with policy makers, epidemiologists and ornithologists, the high priority surveillance counties (Blue Counties) were then identified as the top one third of all counties in GB ranked according to average score for 10km squares (those with the highest average incursion risk scores). In addition, to ensure adequate geographical coverage the top scoring one third of counties in Scotland were also highlighted along with the Scottish Borders region. The Isle of Anglesey and Devon were selected because of the exceptionally high poultry and wild bird scores for these areas and for geographical coverage.

Using these criteria for selecting priority counties, 40% of the counties in GB have been selected as priority counties for targeted surveillance."

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- Ducks - breeder, meat and layer flocks.
- Geese - breeder, meat and layer flocks.
- Feathered game classified as poultry - breeders and rearer flocks of pheasants, partridges and ducks reared for shooting.

Backyard flocks are not included.

2.2.2 Selection of premises in England, Wales, Scotland and Northern Ireland

As described above, the risk matrix developed in part 2 of the Survey Design includes the four specified risk factors - (i) to (iv) - as risk strata. Premises in each class of poultry will be (as far as is possible) selected for assessment and inclusion in the survey based on the existence of relevant risk factors. This process will be applied for each administrative area of the UK.

'Blue County' (BC) forms the primary and universal risk stratum, and is a minimum risk factor requirement for determining selection of UK poultry holdings for all poultry production categories for assessment and recruitment to the survey. Three other risk strata are also defined which incorporate BC and at least one, two or three of the other risk factors described above, namely: WB, MSW and FR.

The total number of available poultry holdings will be estimated from GBPR and available poultry population data for Northern Ireland for each poultry production category for each of the risk strata. In addition, based on UK recruitment and eligibility data from previous national poultry surveys (AHVLA and DARDNI) it is possible to estimate the minimum number of holdings required for selection for each poultry production category.

Poultry holdings will then be assessed and recruited to optimise the number of available holdings 'of greatest risk'. This will start with those holdings that are confirmed during the survey recruitment process to fall within the risk stratum defined as 'poultry holdings located within a Blue County that have at least two of the other three specified risk factors present' *ie.* being free-range (or an equivalent management system); having a water body on the premises; being a mixed species holding, where one of the other species is waterfowl.

Selection of premises is carried out by the Centre for Epidemiology and Risk Analysis (CERA) at the AHVLA, Weybridge for England, Scotland and Wales, and by the Department for Agriculture and Rural Development (DARD) for Northern Ireland. Recruitment and sampling of premises are performed by AHVLA and DARD field staff.

2.2.3 Number of premises to be recruited and sampled across the UK

Premises for recruitment will be selected based on applying the method described in section 2.2.2 above. During the survey recruitment process, the eligibility of individual selected premises will be assessed and confirmed against the relevant risk factors by AHVLA and DARD field staff. Following this local assessment, final recruitment of the holding for sampling will be decided, and the following maximum number of premises for each of the poultry production categories will be recruited for sampling, subject to there being sufficient available qualifying 'at risk' premises.

For chicken layer and turkey fattener flocks, the UK will recruit a maximum of 60 eligible premises. For game ducks (reared for sport shooting), pheasants and partridges, the UK will recruit a maximum of 90 eligible premises (40, 30 and 20 premises respectively). A maximum of 90 eligible premises will be recruited for geese and ducks (duck or goose fattener, breeder or layer holdings; premises where ducks are not being reared for sport shooting) - see Table 2.2.1 and Tables 2.2.2a and 2.2.2b.

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2.2.4 Criteria for assessing premises (including exemptions and exclusions)

(a) Assessment criteria. In addition to individual poultry premises being selected and then assessed as eligible for recruitment based on the methods described in sections 2.2.2 and 2.2.3 above, premises will also be assessed based on the total number of birds on the premises, for a given species, even when they are in separate flocks, specifically:

- Ducks and feathered game (pheasants, partridges and game ducks) - premises containing at least 50 birds;
- Geese - premises containing at least 40 birds;
- Turkeys - premises containing at least 500 birds;
- Chickens - premises containing at least 500 birds

(b) Exemption and Exclusion criteria. Premises and flocks above the "parent" level in the production hierarchy (*ie.* grandparent or above) are excluded from the survey because these premises have high levels of biosecurity.

Chicken breeder and turkey breeder premises and flocks will also typically be excluded on the basis of three factors, specifically:

(i) Biosecurity and flock management standards: The inherent nature of this poultry production category and the high financial value of individual birds and the economic value of breeder flocks as a whole means that higher biosecurity standards and conditions are operated on such premises.

(iii) Flock performance and monitoring: Production targets and associated indices/data are well defined and closely monitored for breeders. Therefore, any deviations from expected performance and/or presentations of unexplained clinical disease are likely to be detected promptly and appropriate action and investigations initiated in a timely manner.

(iv) Host susceptibility: Galliforme poultry, specifically domestic chickens and turkeys, are recognised to be more susceptible to avian influenza infection than anseriforme poultry (ducks and geese). Therefore, clinical disease presentations are likely to be evident and/or detected. Clearly this also assumes that poultry are not routinely vaccinated for AI, in line with UK and EU policy.

It should be noted that some chicken breeder and turkey breeder premises may initially be selected for inclusion in the survey on the basis of being identified as having the four specified risk factors that form the risk matrix strata (as per sections 2.2.1 and 2.2.2 above). During the survey recruitment process, the eligibility of individual premises will be assessed and confirmed against the relevant risk factors. Following this local assessment, final recruitment of the holding for sampling will be decided. Therefore, subject to this assessment process none (or only a proportion) of the selected chicken breeder or turkey breeder premises may be sampled.

Premises containing more than one poultry species, including those mixed poultry species premises where one of the poultry species is waterfowl – designated as risk factor MSW in section 2.2.1 above - are deemed to be of higher risk. If selected, then only the type of poultry for which the selection has been made will be sampled. There will be no sampling of other, secondary species on the premises from that selection.

2.2.5 Sampling

Blood samples for serological testing are collected in accordance with Decision 2010/367/EU, whereby a minimum of ten birds on each premises will be sampled, except in the case of ducks, geese and mallards (game ducks) whereby a minimum of 20 birds on each premises will be sampled.

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The timing of sampling is informed by the seasonality of production, especially for turkeys, geese and feathered game and birds may be sampled as close to slaughter age as practicable, and where appropriate.

Samples may be collected on farms or at slaughterhouses. If the samples are to be collected in a slaughterhouse, then the birds are selected at random from the entire batch.

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Table 2.2.1 POULTRY HOLDINGS [a] (except ducks and geese) TO BE SAMPLED

Serological investigation according to Annex I to Commission Decision 2010/367/EU[4] on holdings of laying hens/free range laying hens

NUTS (2) code[b]	Total number of holdings[c]	Total number of holdings to be sampled	Number of samples per holding*	Total number of tests to be performed per method	Methods of laboratory analysis.
England	1,191	43	10	≥430	H5 & H7 HI test
Scotland	124	4	10	≥40	H5 & H7 HI test
Wales	87	4	10	≥40	H5 & H7 HI test
Northern Ireland	372	9	10	≥90	H5 & H7 HI test
Total	**1,774**	**60**	**n/a**	**≥600**	

(a) Holdings or herds or flocks or establishments as appropriate.
(b) Refers to the location of the holding of origin. In case NUTS (Nomenclature of Territorial Units for Statistics) 2 cannot be used, coordinates (long/lat- to write out) are requested.
(c) Total number of holdings of one category of poultry in concerned NUTS 2 region.

* Number of samples per holding: Minimum of ten birds sampled per holding, or in the case of more than one flock/group being present, five birds sampled per separate flock/group.

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4 O J L 115, 3.5.2007, p. 3.

Serological investigation according to Annex I to Commission Decision 2010/367/EU[5] on holdings of chicken breeders[†]

NUTS (2) code[(b)]	Total number of holdings[(c)]	Maximum number of holdings to be sampled	Number of samples per holding*	Total number of tests to be performed per method	Methods of laboratory analysis.
England	338	7	10	≥70	H5 & H7 HI test
Scotland	23	1	10	≥10	H5 & H7 HI test
Wales	29	1	10	≥10	H5 & H7 HI test
Northern Ireland	159	1	10	≥10	H5 & H7 HI test
Total	**549**	**10**	**n/a**	**≥100**	

(b) Refers to the location of the holding of origin. In case NUTS (Nomenclature of Territorial Units for Statistics) 2 cannot be used, coordinates (long/lat- to write out) are requested.

(c) Total number of holdings of one category of poultry in concerned NUTS 2 region.

[†] Chicken breeder premises and flocks are subject to survey exemption and exclusion criteria, as described in section 2.2.4 (b) above. Specifically, it should be noted that some chicken breeder premises may initially be selected for inclusion in the survey on the basis of being identified as having the four specified risk factors that form the risk matrix strata (as per sections 2.2.1 and 2.2.2 above).

During the survey recruitment process, the eligibility of individual premises will be assessed and confirmed against the relevant risk factors. Following this local assessment, final recruitment of the chicken breeder holding for sampling will be decided.

Therefore, subject to this assessment process none (or only a proportion) of the selected chicken breeder premises may be sampled.

* Number of samples per holding: Minimum of ten birds sampled per holding, or in the case of more than one flock/group being present, five birds sampled per separate flock/group.

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5 O J L 115, 3.5.2007, p. 3.

Serological investigation according to Annex I to Commission Decision 2010/367/EU[6] on holdings of turkeys‡

NUTS (2) code[(b)]	Total number of holdings[(c)]	Maximum number of holdings to be sampled	Number of samples per holding*	Total number of tests to be performed per method	Methods of laboratory analysis.
England	596	63	10	≥630	H5 & H7 HI test
Scotland	9	1	10	≥10	H5 & H7 HI test
Wales	39	2	10	≥20	H5 & H7 HI test
Northern Ireland	63	4	10	≥40	H5 & H7 HI test
Total	**707**	**70**	**n/a**	**≥700**	

(b) Refers to the location of the holding of origin. In case NUTS (Nomenclature of Territorial Units for Statistics) 2 can not be used, coordinates (long/lat- to write out) are requested.

(c) Total number of holdings of one category of poultry in concerned NUTS 2 region.

‡ Turkey breeder premises and flocks are subject to survey exemption and exclusion criteria, as described in section 2.2.4 (b) above. Specifically, it should be noted that some turkey breeder premises may initially be selected for inclusion in the survey on the basis of being identified as having the four specified risk factors that form the risk matrix strata (as per sections 2.2.1 and 2.2.2 above).

During the survey recruitment process, the eligibility of individual turkey breeder premises (up to a maximum of ten turkey breeder holdings in England) will be assessed and confirmed against the relevant risk factors. Following this local assessment, final recruitment of the turkey breeder holding for sampling will be decided.

Therefore, subject to this assessment process none (or only a proportion) of the selected turkey breeder premises may be sampled. This may therefore result in less than the maximum of 70 turkey flocks being sampled in the UK.

* Number of samples per holding: Minimum of ten birds sampled per holding, or in the case of more than one flock/group being present, five birds sampled per separate flock/group.

6 O J L 115, 3.5.2007, p. 3.

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Serological investigation according to Annex I to Commission Decision 2010/367/EU[7] on holdings of farmed game birds

NUTS (2) code[(b)]	Total number of holdings[(c)]	Total number of holdings to be sampled	Number of samples per holding*/**	Total number of tests to be performed per method	Methods of laboratory analysis.
England	1,277	74	≥10	≥740	H5 & H7 HI test
Scotland	175	13	≥10	≥130	H5 & H7 HI test
Wales	57	3	≥10	≥30	H5 & H7 HI test
Northern Ireland	0	0	n/a	0	H5 & H7 HI test
Total	**1,509**	**90**	**n/a**	**≥900**	

(b) Refers to the location of the holding of origin. In case NUTS (Nomenclature of Territorial Units for Statistics) 2 cannot be used, coordinates (long/lat- to write out) are requested.

(c) Total number of holdings of one category of poultry in concerned NUTS 2 region.

* Number of samples per holding for pheasants and partridges: Minimum of ten birds sampled per holding, or in the case of more than one flock/group being present, 5 birds sampled per separate flock/group.

** Number of samples per holding for mallard ducks (feathered game reared for shooting): A total of twenty birds sampled per holding, or in the case of more than four flocks/groups being present, five birds sampled per separate flock/group.

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7 O J L 115, 3.5.2007, p. 3.

Table 2.2.2a DUCK HOLDINGS *TO BE SAMPLED*[(a)] according to Annex I to Decision 2010/367/EU

Serological investigation

NUTS 2 code[(b)]	Total number of duck holdings	Total number of duck holdings to be sampled	Number of samples per holding**	Total number of tests to be performed per method	Methods of laboratory analysis.
England	444	80	20	≥1,600	H5 & H7 HI test
Scotland	24	4	20	≥80	H5 & H7 HI test
Wales	28	3	20	≥60	H5 & H7 HI test
Northern Ireland	16	3	20	≥60	H5 & H7 HI test
Total	**512**	**90**	**n/a**	**≥1,800**	

Table 2.2.2b GEESE HOLDINGS *TO BE SAMPLED*[(a)] according to Annex I to Decision 2010/367/EU

Serological investigation

NUTS 2 code[(b)]	Total number of geese holdings	Total number of geese holdings to be sampled	Number of samples per holding**	Total number of tests to be performed per method	Methods of laboratory analysis.
England	207	76	20	≥1,520	H5 & H7 HI test
Scotland	9	6	20	≥120	H5 & H7 HI test
Wales	11	4	20	≥80	H5 & H7 HI test
Northern Ireland	6	4	20	≥80	H5 & H7 HI test
Total	**233**	**90**	**n/a**	**≥1,800**	

(a) Holdings or herds or flocks or establishments as appropriate.
(b) Refers to the location of the holding of origin. In case NUTS 2 code can not be used, coordinates (long/lat – to write out) are requested.

** Number of samples per holding for ducks and geese: A total of twenty birds sampled per holding, or in the case of more than four flocks/groups being present, five birds sampled per separate flock/group.

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2.3 Laboratory testing: description of the laboratory tests used for the AI Poultry Survey

Laboratory tests conducted for the AI surveillance programme in domestic poultry will be conducted at the National Reference Laboratory (NRL) for Avian Influenza, Veterinary Laboratories Agency (AHVLA), Weybridge for samples collected from poultry flocks in Great Britain. Samples collected from poultry flocks in Northern Ireland will be tested by the Agri-Food and Biosciences Institute (AFBI). Serum samples are screened for the presence of antibodies to avian influenza viruses of subtypes H5 and H7 by haemagglutination inhibition (HI) tests. If a positive serological result is recorded by the screening HI tests, confirmatory HI serological testing (using a heterologous neuraminidase component) is performed. All testing is performed in accordance with extant, specified EU guidelines (Annex I to Commission Decision 2010/367/EU on the implementation of surveillance programmes for avian influenza in poultry and wild birds to be carried out in the Member States and amending Decision 2004/450/EC). If positive confirmatory serological (HI) test results are recorded, further laboratory investigations are undertaken on samples submitted from follow-up field sampling of the flock. This is carried out to establish whether active AI virus infection is present, and forms part of local epidemiological investigations.

The diagnostic tests utilised comprise serological (HI) tests, molecular real time reverse transcription polymerase chain reaction (RT-PCR) methods, and attempted virus isolation in embryonated fowls' eggs, as appropriate. If a virus is isolated serological, molecular and virus characterisation methods used will be consistent with procedures laid down in the EU diagnostic manual/Commission guidelines.

In summary, the laboratory test portfolio utilised at AHVLA Weybridge comprises:

- Haemagglutination Inhibition (HI) tests for orthomyxoviruses - presence of antibodies to influenza A virus subtypes H5 and H7 in serum (poultry).
- Real time RT-PCR for Avian Influenza - screening test for matrix gene of all influenza A virus: for the detection of the matrix gene of any influenza A virus in clinical specimens and amplified samples.
- Real time RT-PCR for Avian Influenza - detects Eurasian H5 AI virus: for the detection of the H5 subtype of avian influenza (AI) virus in clinical specimens and amplified samples.
- Real time RT-PCR for Avian Influenza - detects Eurasian H7 AI virus (HA2 region amplification): for the detection of the H7 gene (HA2 region) of any H7 influenza A virus in clinical specimens and amplified samples.
- Virus isolation and detection in embryonated fowls' eggs.
- Determination and analysis of nucleotide sequence (and deduced amino acid sequence) of specific regions of the genome of AI viruses.

3. Description of the surveillance programme in wild birds

The UK AI wild bird surveillance (AIWBS) programme is risk based and targeted. It is a virological survey and is based on the 'Target Species' list of wild birds detailed in Decision 2010/367/EU, Annex II Part 2. In addition, in Great Britain expert ornithological and epidemiological advice and assessments have determined further higher risk wild bird species that may also be targeted.

The AIWBS programme involves screening samples taken from the following:

- Wild birds found dead during regular warden patrols of targeted selected wetland areas/reserves.
- Unusually high mortality events in wild birds (so-called 'mass mortality incidents' – see below) reported by warden patrols or by members of the public in any county of GB or any area of Northern Ireland (NI), as appropriate.

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In addition, provisions may be made for specific targeted or enhanced AIWBS activities in response to outbreaks of notifiable avian influenza in poultry, in particular HPAI H5N1, or incidents of H5N1 HPAI in wild birds in GB. Such measures would be implemented based on current scientific, epidemiological and ornithological expert opinion and advice, as required.

N.B. The strategy for UK AIWBS is informed by the prevailing national and international disease situation and current scientific opinion. It is possible that any significant changes to either of these will lead to changes in survey design.

3.1 Objective, general requirements and criteria

To protect domestic poultry from HPAI H5N1 infection derived from wild birds by detecting a change in risk to domestic poultry due to HPAI H5N1 incidents in wild birds.

3.2 Design and implementation

1. Active patrolling of wetland reserves for wild birds found dead

Sites have been chosen across the UK based on a variety of factors including the abundance of target species of water birds, proximity to poultry areas and the presence of a site warden. Sites are patrolled on a regular basis by wardens to detect dead wild birds belonging to the target species. Based on risk assessment the frequency of these patrols and number of sites may be increased or decreased. The frequency and number of patrols may be increased in an area following a detection of notifiable avian influenza, particularly H5N1 HPAI in wild birds or domestic poultry. Samples from wild birds found dead in Great Britain are sent to AHVLA Weybridge for AI screening. In NI samples are submitted to AFBI, Stoney Road, Belfast with any positive findings sent to the NRL, AHVLA Weybridge for further testing.

2. Reporting of abnormal or mass mortality in wild birds

A reporting system allows members of the public or staff at a wetland/reserve site to report high mortality events in wild birds, so-called mass mortality incidents. Briefly, a mass mortality incident is defined as involving five or more wild birds of any species in any location (county) of GB. Following a report being made by a member of the public or staff at a wetland/reserve site, standardised case selection criteria are applied. Depending on circumstances, samples will be collected. This may comprise in-field sampling by collection of oropharyngeal (buccal) and cloacal swabs from each bird found dead, or sample collection from the wild bird carcase at an AHVLA or SAC regional laboratory. For the latter, collection of carcases is performed by a designated collection organisation, or less frequently, alternative arrangements may be made involving government veterinary services. In all cases, the carcase location is geo-referenced and, where appropriate, carcases will be transported to a AHVLA Regional Laboratory (in England and Wales) or a SAC Surveillance Centre (in Scotland) where speciation is carried out and, wherever possible, tissue samples collected for AI screening; these are sent to the NRL, AHVLA Weybridge. In NI samples are submitted to AFBI Stoney Road, Belfast with any positive findings sent to the NRL, AHVLA Weybridge for further testing. Reports that are made by a member of the public that do not fulfil the ‘mass mortality incident’ criteria will not be investigated unless additional or extenuating circumstances are identified. Such cases may then be assessed by veterinary staff at the AHVLA Regional Laboratories (or SAC Disease Surveillance Centres in Scotland). Investigations are then progressed on a case-by-case basis against standardised case selection criteria.

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Mortality levels and detection rates are likely to vary in wild birds. To allow for resource planning a weekly ceiling is set for the number of birds submitted in GB. The system allows for targeting surveillance effort to specific regions based on a risk assessment; regionally ceilings may be set within the GB ceiling or in certain regions the ceiling may be abolished i.e. following a case of a detection of H5N1 HPAI or other notifiable avian influenza outbreaks where enhanced surveillance is required. In NI the number of submissions is monitored to ensure resource capability is not exceeded.

Table 3.2.1 WILD BIRDS - investigation according to the surveillance programme for avian influenza in wild birds set out in Annex II to Decision 2010/367/EU

NUTS (2) code/region[(a)]	Wild birds to be sampled [(b)]	Total number of birds to be sampled	Estimated total number of samples to be taken for passive surveillance
UK	See above	850	850
Total	**n/a**	**850**	**850**

(a) Refers to the place of collection of birds/samples. In case NUTS 2 code cannot be used, region as defined in the programme by the Member State is requested

(b) General description of the wild birds are intended to be sampled in the framework of passive surveillance.

3.3 Laboratory testing: description of the laboratory tests used for AI surveillance in wild birds

Laboratory tests conducted for the AI surveillance programme in wild birds will be conducted at the National Reference Laboratory (NRL) for Avian Influenza, Veterinary Laboratories Agency (AHVLA), Weybridge for samples collected from wild birds in Great Britain. Samples collected from wild birds in Northern Ireland are tested by AFBI. The diagnostic tests utilised comprise real time reverse transcription polymerase chain reaction (RT-PCR) methods, and attempted virus isolation in embryonated fowls' eggs. If a virus is isolated serological, molecular and virus characterisation methods used will be consistent with procedures laid down in the EU diagnostic manual/Commission guidelines.

In summary, the laboratory test portfolio utilised at AHVLA Weybridge comprises:

- Real time RT-PCR for Avian Influenza - screening test for matrix gene of all influenza A virus: for the detection of the matrix gene of any influenza A virus in clinical specimens and amplified samples.
- Real time RT-PCR for Avian Influenza - detects Eurasian H5 AI virus: for the detection of the H5 subtype of avian influenza (AI) virus in clinical specimens and amplified samples.
- Real time RT-PCR for Avian Influenza - detects N1 component of AI virus: for the detection of the N1 subtype of avian influenza (AI) virus in clinical specimens and amplified samples.
- Virus isolation and detection in embryonated fowls' eggs.
- Determination and analysis of nucleotide sequence (and deduced amino acid sequence) of specific regions of the genome of AI viruses.

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4. Description of the epidemiological situation of the disease in poultry during the last five years

In the last five years (2007 to 2011) there have been five outbreaks of notifiable avian influenza in poultry in the UK, where virus has been isolated. Below is a list of these outbreaks, in descending chronological order:

- Outbreak of H7N7 HPAI in Oxfordshire, England in June 2008 was confirmed on 4 June 2008 on a single premises of free-range laying hens. Clinical evidence from the farm's records supports virological and serological data that the HPAI infection derived from a pre-existing H7 LPAI virus present on the premises.
- Outbreak of H5N1 HPAI on a large-scale free-range turkey/duck/geese holding in Suffolk, England (confirmed on 13 November 2007). On IP1, infection was confirmed in turkeys and ducks, but not in geese. Epidemiological links were established and as a result of this, another infected turkey premises was identified. The maximum prevalence of infection in this group was 10%. Genetic analyses of the virus isolates from the poultry on the two IPs indicated that the birds were infected from a single source. The isolate had the closest genetic identity to an isolate from wild birds in the Czech Republic detected in mid-2007.
- An outbreak of H7N2 LPAI in backyard poultry in Corwen, Wales (confirmed on 24 May 2007). The outbreak also had a second linked infected premises in England (St Helens, Merseyside). The second IP was found as a result of market tracing carried out by the veterinary authorities.
- An outbreak of H5N1 HPAI in an intensive turkey premises in Holton, Suffolk (confirmed 3 February 2007). The farm consisted of 22 enclosed, fan-ventilated houses, which held a total of 159,000 birds. The farm was adjacent to a complex of plants including a slaughterhouse, cutting plant, meat products plant and a cold store. The isolated virus was sequenced and shown to be notably similar (almost 100% homologous) to that recovered from outbreaks of H5N1 HPAI in Hungary in domestic geese in January 2007.

In addition, an outbreak of H7N3 LPAI in chickens in Dereham, Norfolk was confirmed on 28 April 2006. The outbreak affected three poultry premises. The first flock to be affected in this outbreak was an outdoor chicken layer flock; it is believed that a likely source of virus introduction was wild birds. Spread to the other two flocks is believed to have occurred through fomite transmission and wildlife vectors.

There have also been detections of antibodies to avian influenza viruses of subtypes H5 and H7 during the course of the poultry survey. During the 2010 poultry survey three duck premises and one game duck site were identified as showing a serological response against H5. In 2009, two duck premises were identified as showing a serological response against H5 or H7 antibodies by HI test. In 2008, eight premises (three duck flocks and five geese flocks) were identified as showing a serological response against H5 or H7 antibodies by HI test. In 2007, antibodies to avian influenza viruses of subtypes H5 and H7 were detected in flocks of ducks, geese and quail. Three premises with ducks, six premises containing geese and a single quail premises had low levels of serological response. In 2006 antibodies to H5 were detected in a flock of free-range geese and antibodies to avian influenza viruses of subtypes H5 and H7 were detected in a flock of free-range ducks. Each year all cases with an H5 or H7 serological reactor (by HI test)were followed up, re-sampled and underwent further field investigation and testing. None of the further tests showed positive results indicating the absence of active infection on these premises. The most likely explanation is that these birds had prior exposure to LPAI viruses of subtypes H5 and H7.

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4.1 Measures included in the programme for surveillance in poultry

4.1.1 Designation of the central authority in charge of supervising and coordinating the departments responsible for implementing the programme

Defra coordinates the departments and agencies responsible for implementing the programme and is responsible for making policy decisions.

The National Reference Laboratory (NRL) for Avian Influenza & Newcastle Disease at AHVLA Weybridge is responsible for all aspects of laboratory testing for samples collected in Great Britain and any samples referred by DARD/AFBI, Northern Ireland, reporting of laboratory results to Defra and provision of technical advice and consultancy.

The Centre for Epidemiology and Risk Analysis (CERA) and data support groups at AHVLA Weybridge is responsible for epidemiological analysis of poultry data for survey design and for analysis of results.

In NI, DARD Veterinary Service is responsible for collecting samples for submission to AFBI Stoney Road, with any positive findings sent to AHVLA Weybridge for further testing. Survey progress and final data are sent to AHVLA Weybridge for collation into the UK return.

In GB, the field staff of AHVLA (formerly the Animal Health agency) are responsible for collecting of samples within the designated timeframe and submitting these for laboratory testing at the NRL at AHVLA Weybridge.

4.1.2 System in place for the registration of holdings

In Great Britain registration is compulsory for owners keeping 50 or more poultry on a premises; this includes premises that are stocked with more than 50 birds for only part of the year. Owners of smaller flocks may register on a voluntary basis. In Northern Ireland (NI) all poultry owners must register with the NI bird register.

4.1.3 Data on vaccination carried out

Vaccination against avian influenza is not permitted in the UK except for voluntary vaccination of birds in zoos in England. This is not permitted in Wales, Scotland or Northern Ireland.

5. Description of the epidemiological situation of the disease in wild birds during the last five years

A programme of AIWBS has been active in the UK since October 2005. In the last five years (2007 to 2011) there has been one incident where Eurasian lineage H5N1 HPNAI has been detected in wild birds in the UK. In January 2008, H5N1 HPNAI was detected in three Mute swans (*Cygnus olor*) in Abbotsbury, Dorset. During the course of this incident (January/February 2008) virus was detected from a total of ten Mute swans and one Canada goose (*Branta canadensis*) within the 3km Wild Bird Control Area. No evidence of spread to the local poultry population was detected.

In addition, in April 2006, virus was detected and isolated from a Whooper swan (*Cygnus cygnus*) found dead in Cellardyke harbour, Fife, Scotland. Further investigations during the course of this incident also revealed that there had been no evidence of further spread of the virus to the local wild bird or poultry populations.

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As expected, evidence of influenza A virus infection and isolation of numerous LPAI viruses of varying subtypes has been identified from a variety of wild birds, predominately waterfowl (*Anatidae* spp), as part of the AI wild bird surveillance programme.

5.1 Measures included in the programme for surveillance in wild birds

5.1.1 Designation of the central authority in charge of supervising and coordinating the departments responsible for implementing the programme

Defra coordinates the departments responsible for implementing the programme and is responsible for making policy decisions.

The National Reference Laboratory (NRL) for Avian Influenza & Newcastle Disease at AHVLA Weybridge is responsible for all aspects of laboratory testing for samples collected in Great Britain and any samples referred by DARD/AFBI, Northern Ireland, reporting of laboratory results to Defra and provision of technical advice and consultancy.

The Centre for Epidemiology and Risk Analysis (CERA) and data support groups at AHVLA Weybridge is responsible for epidemiological analysis of wild bird survey and sampling data.

Technical ornithological advice is provided by a panel of ornithological experts from government agencies and from non-governmental organisations.

In NI, all samples are sent to AFBI Stoney Road, with any positive findings sent to AHVLA Weybridge for further testing. All results are sent to AHVLA Weybridge for collation into the UK return.

In GB, a number of designated organisations are responsible for collecting wild bird carcases/samples within designated timeframes and submitting these for either sampling at AHVLA Regional Laboratories (in England and Wales) or SAC Surveillance Centres (in Scotland), or for laboratory testing at AHVLA Weybridge.

5.1.2 Description and delimitation of the geographical and administrative areas in which the programme is to be applied

This is based on a risk assessment and may vary annually based on current expert scientific advice.

5.1.3 Estimation of the local and/or migratory wildlife population

Expert ornithological advice has been sought on details of the migrating wild bird population. Wetland Bird Survey (WEBs) data has been used as a baseline for any statistical analyses.

6. Measures in place as regards the notification of the disease

It is a legal obligation for anyone suspecting the presence of an avian notifiable disease in poultry or other captive birds to contact Government Veterinary Authorities. Anyone suspecting a notifiable disease must report this to a local Animal Health Office.

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7. Costs

7.1.1 Detailed analysis of the costs[8] for the implementation of survey programmes for avian influenza in poultry during 2012 - Poultry[9]

Methods of laboratory analysis	Number of holdings to be tested	Number of samples to be taken per holding	Total number of samples	Total cost of one test*	Total cost of all tests	Comments
a. Testing costs (as below - *estimated for financial year 2012/2013)						
Haemagglutination inhibition test (HI) for H5/H7 antibodies	410	≥10 depending upon the category of bird and number of separate groups/sheds of birds on holding	11,000 (22,000 HI tests for H5 and H7)	£5.70	£125,400	**AHVLA test code (TC) 0917**
Virus isolation test			10	£66.50	£665	**AHVLA TC0815**
PCR tests			700	£22.00	£15,400	**AHVLA TC0695, TC0691**
Avian influenza H7 RRT-PCR			100	£22.00	£2,200	**AHVLA TC0716, TC0717**
b. Other - staff time					£85,102	**AHVLA epidemiological expertise, data management, admin and expert advice/consultancy.**
c. Other – exceptional costs					£1,500	**Postage, Kits, travel, etc**
d. Sampling costs					£438,338[10]	**Costs accrued to Government's AHVLA field staff in the collection of samples.**
TOTAL					**£668,605**	

[8] Data to be given in national currency, VAT excluded. From this amount testing costs will be reimbursed according provisions of Article 3 of Commission Decision 2005/464/EC
[9] A separate table shall be used for each type of poultry category (in accordance with the requirements of the Annex I to Commission Decision 2005/464/EC). For wild birds shall be used separate table. The number of samples and the total costs per method of laboratory analyses shall be provided.
[10] Best estimate based on figures from 2011

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7.1.2 Wild birds - AHVLA costs[11] for the implementation of survey programmes for avian influenza in wild birds during 2011 - Wild birds

Methods of laboratory analysis	Total number of samples	Total cost of one test*	Total cost of all tests	Comments
a. Testing costs (as below - *estimated for financial year 2012/2013)				
Virus isolation test	40	£66.50	£2,660	TC0815
Av 'flu H7 (HA2) PCR	40	£22.00	£880	TC0716
Av 'flu H7 (CS) PCR	40	£22.00	£880	TC0717
Matrix gene PCR	2,100	£22.00	£46,200	TC0691
Av' flu H5 virus PCR	100	£22.00	£2,200	TC0695
Av' flu sequence	10	£210.00	£2,100	TC1312
IVPI	5	£194.00	£970	TC1273
Post-mortem sampling	850	£82.50	£70,125	TC0001/0575/0600/0649/TC1601
b. Others (AHVLA staff costs)			£74,200	Includes exceptional costs
c. Sampling costs			£120,000[12]	These are costs paid by the UK Government to delivery agents in the collection of samples.
Total costs			**£320,215**	

[11] Data to be given in national currency, VAT excluded.
[12] Best estimate based on figures from 2011

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7.2 Summary of the costs

7.2.1 Poultry surveillance

Measures eligible for co-financing surveillance in poultry			
Methods of laboratory analysis	**Number of tests to perform per method**	**Unitary test cost per method** (estimated for financial year 2012/2013)	**Total cost**
Serological pre-screening[13]	nil	-	-
Haemagglutination inhibition test (HI) for H5/H7[14] antibodies (TC0917)	22,000 (H5 and H7 HI tests)	£5.70	£125,400
Virus isolation tests (TC0815)	10	£66.50	£665
PCR tests (TC0691,0695,0716,0717)	800	£22.00	£17,600
Total			**£143,665**

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13 Specify the laboratory test to be used.
14 Specify number of tests for H5 and for H7.

7.2.2 Wild bird surveillance

Measures eligible for co-financing surveillance wild birds			
Methods of laboratory analysis	**Number tests to perform per method**	**Unitary test cost per method** (estimated for financial year 2012/2013)	**Total cost**
Virus isolation test (TC0815)	40	£66.50	£2,660
Av 'flu H7 (HA2) PCR (TC0716)	40	£22.00	£880
Av 'flu H7 (CS) PCR (TC0717)	40	£22.00	£880
Matrix gene PCR (TC0691)	2,100	£22.00	£46,200
Av' flu H5 virus PCR (TC0695)	100	£22.00	£2,200
Av' flu sequence (TC1312)	10	£210.00	£2,100
IVPI (TC1273)	5	£194.00	£970
Post-mortem sampling (TC0001,0004,0575,0600,0649,1601)	850	£82.50	£70,125
Total			**£126,015**

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