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**A REPORT ON SURVEYS**  
**FOR**  
**AVIAN INFLUENZA IN POULTRY**  
**IN**  
**MEMBER STATES**  
**DURING**  
**2005**

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## **Abstract**

Experience has shown that some strains of H5 and H7 subtype of avian influenza viruses have the ability to mutate to highly pathogenic strains after having circulated in the poultry population for some time. This situation is liable to lead to high mortality in poultry and severe economic losses to the poultry industry that could be reduced by implementing a screening system in the Member States to allow earlier detection and control of such precursor strains. Surveys for avian influenza in poultry in Member States undertaken in 2005 were carried out under Commission Decision 2004/111/EC. The objectives were to; detect the prevalence of infections with avian influenza virus subtypes H5 and H7 in different species of poultry by repeating the screening exercise of 2003/04 in a modified, more targeted manner; contribute to knowledge of the threats to animal health from wildlife; maintain the connection and integration of human and veterinary networks for influenza surveillance. The survey design was based upon examination of all categories of poultry in each Member State using a statistical design. The number of birds sampled from each farm was defined to ensure 95% probability of identifying at least one positive bird if the prevalence of seropositive birds was  $\geq 30\%$ . All 25 Member States participated in the survey testing all categories of poultry subject to regional variation including: laying hens, broilers, chicken breeders, fattening turkeys, turkey breeders, backyard flocks, ducks, geese, farmed game birds (including quail), ratites and miscellaneous categories such as free range poultry and ready-to-lay pullets.

A total of 78 holdings were serologically positive for influenza A viruses of which 74 holdings were confirmed as positive for H5 or H7 subtypes (69 and 5 respectively). The majority (68/78) of serologically positive holdings were ducks and geese and of these 58 were located in one member state. No H5 or H7 positive holdings were reported for broilers, fattening turkeys, turkey breeders, farmed game birds or backyard flocks (only three Member States tested backyard flocks). Six member states reported H5 positive holdings from five different poultry categories. Three member states reported H7 positive holdings from three different poultry categories. The upper limits for prevalence at the 95% confidence limit ranged from 0.11% to 19.38% in Member States where no positive holdings were detected and 0.2% to 6.77% in Member States reporting H5 or H7 positive holdings. It should be noted however for member states with relatively high upper 95% confidence limits, the assessment was based upon a small number of holdings and the data should therefore be treated with caution.

## **Background**

Experience has shown that some strains of H5 and H7 subtype of avian influenza viruses have the ability to mutate to highly pathogenic strains after having circulated in the poultry population for some time. This situation is liable to lead to high mortality in poultry and severe economic losses to the poultry industry that could be reduced by implementing a screening system in the Member States to allow earlier detection and control of such precursor strains.

The Scientific Committee on Animal Health and Animal Welfare (SCoAHAW) recommended the implementation of serological surveys of poultry populations in Member States in order to determine the prevalence of low pathogenic avian influenza (LPAI) viruses of H5 and H7 subtypes.

Surveys for avian influenza in poultry and wild birds in Member States were first carried out in 2003-2004 under the Commission Decision 2002/649/EC. Surveys undertaken in 2004-2005 were carried out under Commission Decision 2004/111/EC

This report is based upon the results from the third survey, 2005-2006 under Commission Decision 2004/630/EC.

## **Objectives**

1. To detect the prevalence of infections with avian influenza virus subtypes H5 and H7 in different species of poultry by repeating the screening exercise of 2003/04 in a modified, more targeted manner.
2. To further contribute to a cost-benefit study in relation to eradication of all H5 and H7 subtypes from poultry envisaged by the change in definition of avian influenza.
3. To contribute to knowledge of the threats to animal health from wildlife.
4. To maintain the connection and integration of human and veterinary networks for influenza surveillance.

## **Materials and methods**

### General approaches

Testing of samples was carried out at National Laboratories in Member States and all results (both serological and virological) were sent to the Community Reference Laboratory (CRL) for collation. Specific protocols to accompany the sending of material to the CRL and reporting tables for collection of survey data were provided. The CRL provided technical support and kept an enlarged stock of diagnostic reagents appropriate to the survey.

All Avian Influenza virus isolates should have been submitted to the CRL. Viruses of H5/H7 subtype were subjected to the standard characterisation tests (nucleotide sequencing/IVPI) according to Council Directive 92/40/EEC.

All positive findings should have been retrospectively investigated at the holding and the conclusions of the investigation reported to the Commission and the CRL.

### Survey design

The survey design was based upon examination of all categories of poultry in each Member State using a statistical design. Sampling should have been stratified throughout the whole country so that the results could be considered representative

for the whole Member State. The sampling period should have covered the winter months and where appropriate, adapted to identified periods where presence of other poultry hosts might pose a greater risk for introduction of disease.

The number of farms sampled by category of poultry, excluding turkeys, ducks and geese, were defined to ensure the identification of at least one infected flock if the prevalence of infected farms was at least 5%, with a 95% confidence interval (see table I). For turkey, duck/geese holdings the number of farms sampled were defined to ensure the identification of at least one infected flock if the prevalence of infected farms was at least 5%, with a 99% confidence interval (see table II). The number of birds sampled from each farm was defined to ensure 95% probability of identifying at least one positive bird if the prevalence of seropositive birds was  $\geq 30\%$ .

**Table I: Number of holdings to be sampled of each poultry category (except turkey, duck/geese holdings)**

<b>Number of holdings per poultry category per Member State</b>	<b>Number of holdings to be sampled</b>
Up to 34	All
35 -50	35
51-80	42
81-250	53
>250	60

**Table II: Number of turkey, duck/geese holdings to be sampled**

<b>Number of holdings per poultry category per Member State</b>	<b>Number of holdings to be sampled</b>
Up to 46	All
47 -60	47
61-100	59
101-350	80
>350	90

Detection of seroprevalence of H5/H7 in poultry except ducks, geese and quail

Populations sampled reflected the major poultry hosts in that Member State.

The following groups were ideally included in the survey if appropriate: layers, chicken breeders, fattening turkeys, breeder turkeys, backyard flocks, farmed game birds and ratites.

Member States that carried out sampling for ND to maintain their status as ND-free non-vaccinating countries (Decision 94/327/EC) were permitted to utilise samples from breeding flocks for examination for H5/H7 antibodies.

The number of samples taken from a host species population also considered the susceptibility and increased exposure to infections with influenza A virus, i.e. a greater focus on turkeys was encouraged compared to broilers when both were available in a given region.

Blood samples were collected from all species of poultry for serological examination. From each farm/holding at least 5-10 birds (except ducks and geese) were sampled and tested (ideally from different sheds if more than one shed was present on the farm/holding).

#### Detection of H5/H7 in ducks, geese and quail

Blood samples from ducks, geese and quail were taken for serological testing, preferably from birds that were kept outside in fields. 40-50 blood samples per holding were taken for serological testing.

Member States were also permitted to carry out virological examination of cloacal swabs or faeces. 10 swabs/faecal samples were collected per holding for virological investigation and tested as pools of five samples.

### **Laboratory tests**

Laboratory tests were carried out in accordance with Council Directive 92/40/EEC. However, if laboratory tests not laid down in the Directive 92/40/EEC or described in the OIE Terrestrial Manual were used, Member States should have provided the necessary validation data to the CRL, when submitting their programme for approval.

All positive serological findings were confirmed by the National laboratories for avian influenza by haemagglutination-inhibition test using designated strains supplied by the Community Reference Laboratory:

- H5**
  - a) Initial test using Duck/Denmark/64650/03 (H5N7)
  - b) Test all positives with Ostrich/Denmark/72420/96 (H5N2) to eliminate N7 cross reactive antibody.
- H7**
  - a) Initial test using Turkey/England/647/77 (H7N7).
  - b) Test all positives with African Starling/983/79 (H7N1) to eliminate N7 cross reactive antibody."

### **Result interpretation**

Viruses were selected based on broad antigenic reactivity within subtype. Interpretation of positive samples followed international standards as specified in Directive 92/40/EEC. Sera with HI titres of greater or equal to  $2^4$  were scored positive. Samples positive in tests with one strain of a particular subtype were subjected to a further test with the additional recommended strain for that H subtype. Overall a serum sample was considered positive if HI titres of greater or equal to  $2^4$  were obtained in tests with both virus strains of the same subtype.

### **Results**

#### **Programme approval**

Member States submitted their programmes that were studied by the Commission and an expert of the Community Reference Laboratory. Through Decision 2004/630/EC the programmes for the individual Member States were approved and standard forms laid

down for reporting results and costs of the programme performed in each Member State.

### General comments

The same 25 Member States took part in the 2005-2006 Avian Influenza Survey as the 2004-2005 Avian Influenza Survey, compared to 15 Member States in the 2003-2004 Survey.

It has been assumed that the sensitivity and specificity of all tests employed in the survey were 100%.

Eleven countries reported as a single region: Austria, Cyprus, Czech Republic, Denmark, Finland, Lithuania, Luxembourg, Malta, Slovenia, Sweden and The Netherlands. The remaining 14 countries reported many individual regions. The summary tables 1-10 and figures are based upon the total number of holdings sampled for each category by each Member State.

The number of samples taken per holding was not reported for all Member States. Therefore it has been assumed that the stated procedure was correctly followed and that at least 5-10 birds were selected at random from each holding.

### Specific comments relating to individual Member State's programmes

The total number of holdings reported for each poultry category is given in parentheses in the text below.

#### ***Austria***

- Samples were submitted from laying hens/free range laying hens, fattening turkeys, ducks/geese and ratites.
- 60 laying hen holdings were sampled (1600 total).
- In the 60 tested battery farms a total of 600 samples were tested.
- 80 fattening turkey holdings were sampled (120 total).
- In the 80 turkey farms a total of 800 samples were tested.
- 32 duck/geese holdings were sampled (43 total).
- In the 32 duck/ geese farms a total of 1324 samples were tested.
- 5 ratite holdings were sampled (5 total)
- In the 5 ostrich farms a total of 50 samples were tested.
- Austria reported as one region.
- **No positive samples were reported, as in the previous two years.**

#### ***Belgium***

- Samples were submitted from laying hens, chicken breeders, fattening turkeys, breeder turkeys, ducks/geese, game birds, ratites and others (ornamental hens).
- 204 laying hen holdings were sampled (total not known)
- 72 chicken breeder holdings were sampled (total not known)

- 37 fattening turkey holdings were sampled (48 turkey holdings overall, total for fattening turkeys not known)
- 2 breeding turkey holdings were sampled (48 turkey holdings overall, total for breeder turkeys not known).
- 24 duck/geese holdings were sampled (total not known).
- 12 game bird holdings were sampled (total not known)
- 4 ratite holdings were sampled (total not known)
- 5 others holdings (ornamental hens) were sampled (total not known)
- Belgium reported from five regions.
- **1 free-range laying hen holding was serologically positive for influenza A viruses (subtype H5).**
- **3 chicken breeder holdings were serologically positive for influenza A viruses (2 holdings were subtype H5 and 1 holding was subtype H7).**
- **2 duck and 2 geese holdings were serologically positive for influenza A viruses subtype H5.**
- **60 cloacal swabs were taken on all of the duck and goose holdings for a supplementary virological analysis. A low pathogenic H3N1 influenza A virus was isolated from a duck holding.**
- **No positive samples were reported in 2004-2005.**

### ***Cyprus***

- Samples were submitted from laying hens, chicken breeders, broilers, fattening turkeys, backyard flocks, ducks/geese, partridges, quails, and ostriches.
- 30 laying hen holdings were sampled (30 total).
- 15 broiler holdings were sampled (201 total).
- 1 chicken breeder holding was sampled (21 total)
- 5 fattening turkey holdings were sampled (8 total).
- 13 backyard flocks were sampled (9034 total)
- 2 duck/geese holdings were sampled (2 total).
- 2 game bird holdings were sampled (6 total)
  - These were reported as:
    - 1 partridge holding was sampled (5 total)
    - 1 quail holding was sampled (1 total).
- 3 ostrich holdings were sampled (8 total).
- Cyprus reported as one region.
- **No positive samples were reported, as in the previous year.**

### ***Czech Republic***

- Samples were submitted from laying hens, turkey breeders, ducks and geese.

- 53 laying hen holdings were sampled (182 total).
- 4 turkey breeder holdings were sampled (4 total).
- 34 duck/geese holdings were sampled (34 total).
- Czech Republic reported as one region.
- **No positive samples were reported, as in the previous year.**

### ***Denmark***

- Samples were reported from layer hens/free-range laying hens, broilers, chicken breeders, fattening turkeys, ducks and geese.
- 186 laying hen/free-range laying hen holdings were sampled (total not reported).
- 5 broiler holdings were sampled (8 total).
- 44 chicken breeder holdings were sampled (70 total).
- 30 fattening turkey holdings were sampled (40 total).
- 18 duck/geese holdings were sampled (18 total).
- Denmark reported as one region.
- **No positive samples were reported in poultry, as in the previous year.**

### ***Estonia***

- Samples were reported from laying hens.
- 13 laying hen holdings were sampled (13 total).
- Estonia reported from 9 regions.
- **No positive samples were reported, as in the previous year.**

### ***Finland***

- Samples were reported from laying hens, chicken breeders, breeder turkeys, ducks/geese, farmed game and ratites.
- 62 laying hen holdings were sampled (1585 total).
- 65 chicken breeder holdings were sampled (65 total)
- 75 turkey breeder holdings were sampled (163 total).
- 15 duck/geese holdings were sampled (15 total).
  - These were reported as:
    - 8 duck holdings were sampled.
    - 4 geese holdings were sampled.
    - 3 mallard holdings were sampled.
- 19 pheasant holdings were sampled (41 total).
- 2 ratite holdings were sampled (22 total). Of the 22 farms in total, 10 farms have more than 10 birds.



- Finland reported as one region.
- **No positive samples were reported, as in the previous years.**

### **France**

These results are “best estimates” as full verification of these figures could not be obtained.

- Samples were reported from laying hens, free-range chickens, free-range and housed meat turkeys, breeding turkeys, ducks and geese, quails and guinea fowl.
- 113 layer hen holdings were sampled from 11 regions (1,040 total).
- 156 chickens (free-range holdings and holdings for “local market”) were sampled from 12 regions (4726 total). Reported in Table 10.
- 224 fattening turkey holdings (free range meat and housed meat turkeys) were sampled from 10 regions (2,654 total).
- 57 turkey breeder holdings were sampled from two regions (317 total)
- 530 ducks/geese holdings were sampled (2,856 total).
  - These were reported as:
    - 485 duck holdings were sampled (2,739 total).
    - 45 geese holdings were sampled (117 total).
- 65 game bird holdings were sampled from 8 regions (482 total)
  - These were reported as:
    - 20 quail holdings were sampled from 8 regions (77 total)
    - 45 guinea fowl holdings were sampled from 4 regions (405 total)
- France reported from 16 regions.
- **2 of 156 holdings of "chickens (free-range chicken holdings and holdings for 'local market')" were serologically positive for influenza A viruses, 1 holding was H5 subtype. 1 holding was virologically positive but negative for H5 subtype. (In 2004-2005 2 of 267 free range chicken holdings were positive, both were negative for H5 and H7 subtypes)**
- **3 of 224 holdings of free range and meat turkeys were serologically positive for influenza A viruses, none were positive for H5 or H7 subtype. (In the 2004-2005 survey 11 out of 242 holdings of fattening turkeys were positive [1 was H5 positive]).**
- **A total of 44 duck holdings were serologically positive for influenza A virus H5 subtype. A further 2 duck holdings were inconclusive for H5 subtype. On a follow up visit 2 holdings were virologically positive for H5 subtype and 5 holdings were virologically positive but not for H5 subtype.**
- **Two duck holdings were serologically positive for influenza A virus H7 subtype and one was confirmed by virology as H7 subtype.**
- **11 geese holdings were positive on serology for H5 subtype and a further 2 holdings were inconclusive. On a follow up visit one holding was reported**

as virologically positive but the subtype was not confirmed (analysis reported as ongoing).

- One goose holding was serologically positive for influenza A virus H7 subtype. This holding was virologically negative.
- (In 2004-2005 18 of 168 duck holdings were positive for avian influenza subtypes H5 & H7, these samples were positive on serology, but tested negative on virology). Two geese holdings were also positive for influenza A subtype H5 and both were virologically negative.)

### **Germany**

- Samples were reported from chicken (no reliable stratification), turkey (no reliable stratification), ducks/geese and ratites.
- 90 chicken holdings “(no reliable stratification)” were sampled from 12 regions (87,091 total). Reported in Table 1.
- 110 turkey holdings “(no reliable stratification)” were sampled from 12 regions (2,769 total). Reported in Table 4.
- 187 duck/geese holdings were sampled from 12 regions (15,024 total).
- 9 ratite holdings were sampled from 3 regions (total not known).
- Germany reported from 12 regions.
- **Two duck/geese holdings were serologically positive for influenza A viruses, 1 holding for subtype H5 and one holding for H7. 1 holding was virologically positive for H6N1 influenza A virus. (In 2004-2005 5 geese holdings were serologically positive for influenza A viruses; 4 were positive for the subtype H5 and 1 was positive for the H7 subtype).**
- **1 ratite holding was serologically positive for influenza A viruses and a follow-up investigation revealed the presence of subtype H5N3 Influenza A virus.**

### **Greece**

- Samples were reported from laying hens, broilers, fattening turkeys, ducks and geese, quail and ratites. Standard antigens from the CRL were not used in the programme.
- 11 laying hen holdings were sampled from 2 regions (177 total)
- 71 broiler holdings were sampled from 5 regions (842 total)
- 34 fattening turkey holdings were sampled from 7 regions (35 total)
- 37 duck/geese holdings were sampled from 12 regions (Total not known)
- 2 quail holdings were sampled (4 total)
- 3 ratite holdings were sampled (5 total)
- Greece reported from 12 regions overall. The number of regions sampled varied by poultry category.
- **No positive samples were reported [last year 2 laying hen holdings, 2 broiler holdings and one fattening turkey holding were found positive for**

**type A influenza viruses (the method used was ELISA) but negative for subtypes H5 & H7 (the method used was HI)].**

### ***Hungary***

- Samples were reported from holdings of chickens (breeding flocks and table egg layer holdings), turkeys (breeding flocks and broiler holdings), “holdings of other poultry” (quail, ostrich, pheasants, partridges), ducks and geese.
- 95 chicken holdings were sampled (total 1532). Chickens (breeding flocks and table egg layer holdings) were reported as laying hens.
- 133 turkey holdings (breeding flocks and broiler holdings) were sampled (total 407)
- 268 holdings of ducks/geese were sampled (total 767)
  - These were reported as
  - 111 duck holdings were sampled (total 314).
  - 157 geese holdings were sampled (total 453).
- 31 “holdings of other poultry” (quail, ostrich, pheasants, partridges) were sampled (total 79)
- Hungary reported from 20 regions.
- **No positive samples were reported, as in the previous year’s survey.**

### ***Ireland***

- Samples were reported from caged laying hens, free range laying hens, broiler breeders, fattening turkeys, breeding turkeys, ducks and geese.
- 148 laying hen holdings were sampled (183 total).
  - These were reported as two sub-categories:
  - 70 caged laying hen holdings were sampled (73 total).
  - 78 free-range laying hen holdings were sampled (110 total).
- 62 broiler breeder holdings were sampled (92 total).
- 80 fattening turkey holdings were sampled (107 total).
- 12 breeding turkey holdings were sampled (13 total).
- 2 ducks and 1 goose holdings were sampled (3 total).
- Ireland reported from 8 regions. The number of regions sampled varied by poultry category.
- **No positive samples were reported, as in the previous years.**

### ***Italy***

- Samples were reported from laying hens, chicken breeders, fattening turkeys, breeding turkeys, ducks and geese, ratites, partridges, pheasants, and guinea fowl. Standard antigens from the CRL were not used in the programme.
- 1101 laying hen holdings were sampled (1360 total).

- 224 chicken breeder holdings were sampled (270 total).
- 467 fattening turkey holdings were sampled (560 total).
- 47 breeding turkey holdings were sampled (65 total).
- 132 duck/geese holdings were sampled (178 total).
- 334 game bird holdings were sampled (506 total)
  - These were reported as:
    - 249 partridges and pheasant holdings were sampled. (381 total)
    - 85 guinea fowl holdings were sampled (125 total)
- 68 ratite holdings were sampled (256 total).
- Italy reported from 20 regions.
- **No positive samples were reported (in contrast in 2004-2005 2 broiler holdings were positive for subtype H7 influenza A viruses, 27 fattening turkey holdings were positive for subtype H7 influenza A virus, 1 duck/geese holding was serologically positive for H5 influenza A virus and 1 ratite holding was also positive for H5 influenza A virus).**

#### ***Latvia***

- Samples were reported from laying hens, fattening turkeys, geese, guinea fowl, pheasants, quails and ratites.
- 27 laying hen holdings were sampled (27 total).
- 1 fattening turkey holdings was sampled from 2 regions (2 total).
- 1 goose holding was sampled from 1 of 2 regions (2 total).
- 7 game bird holdings were sampled (9 total)
  - These were reported as:
    - 1 guinea fowl holding was sampled (2 total).
    - 2 pheasant holdings were sampled from 1 region (2 total).
    - 4 quail holdings were sampled from 4 of 5 regions (5 total).
- 2 ostrich holdings were sampled from 2 regions (3 total).
- Latvia reported from 18 regions.
- **No positive samples were reported, as in the previous year's survey.**

#### ***Lithuania***

- Samples were reported from laying hens, broilers, chicken breeders, fattening turkeys, turkey breeders, ducks and geese, backyard flocks and ratites. Standard antigens from the CRL were not used in the programme.
- 11 laying hen holdings were sampled (22 total).
- 4 broiler holdings were sampled (20 total).
- 6 chicken breeder holdings were sampled (11 total).

- 1 fattening turkey holding was sampled (4 total).
- 1 turkey breeder holding was sampled (2 total)
- 17 back yard flocks were sampled (174,213 total)
- 1 duck/goose holding was sampled (2 total)
- 1 ratite holding was sampled (7 total).
- Lithuania reported as a single region.
- **No positive holdings were reported, as in the previous year's survey.**

### ***Luxembourg***

- Samples were reported from laying hens, free range laying hens and ratites.
- 11 laying hen holdings were sampled (11 total).
  - These were reported as:
    - 8 laying hen holdings were sampled from holdings with more than 350 laying hens (8 total).
    - 3 free-range laying hen holdings were sampled (3 total).
- 1 ratite holding was sampled (1 total).
- Luxembourg reported from 1 region.
- **No positive holdings were reported, as in the previous year's survey.**

### ***Malta***

- Samples were reported from "sampled poultry holdings". Standard antigens from the CRL were not used in the programme.
- 63 poultry holdings were sampled (total 305) and reported as one category, this information has been included in Table 1.
- 40 laying hen holdings were due to be sampled in submitted programme.
- 24 mixed poultry holdings were due to be sampled in submitted and approved programme.
- 1 turkey holding was due to be submitted in submitted programme.
- Malta reported from 1 region.
- **No holdings were positive in 2005-2006 (in 2004-2005 14 laying hen holdings were reported positive for influenza A viruses, all 14 were negative for subtypes H5 and H7).**

### ***Poland***

- Samples were reported from laying hens, chicken breeders, turkeys, ducks and geese, and ostriches.
- 85 laying hen holdings were sampled from 3 regions (96 total).
- 59 chicken breeder holdings were sampled from 3 regions (54 total).

- 102 turkey holdings were sampled from 3 regions (316 total). Reported as fattening turkeys.
- 241 duck/geese holdings were sampled from 3 regions (325 total).
- 19 ostrich holdings were sampled from 3 regions (25 total).
- Poland reported from 16 regions.
- **2 duck/geese holdings were serologically positive for H5 influenza A viruses but the results of the virological tests were negative. (In 2004-2005 1 duck/geese holding was serologically positive for H5 subtype).**

### ***Portugal***

- Samples were reported from laying hens, free range laying hens, chicken breeders, fattening turkeys, breeder turkeys, ducks and geese, quail, zoos and pet shops.
- 211 laying hen holdings were sampled (268 total).
  - 126 laying hen holdings were sampled (178 total).
  - 85 free-range laying hen holdings were sampled (90 total).
- 33 chicken breeder holdings were sampled (33 total).
- 112 fattening turkey holdings were sampled (187 total).
- 4 breeder turkey holdings were sampled (4 total).
- 14 duck/geese holdings were sampled (14 total).
- 24 quail holdings were sampled (24 total).
- 94 ratite holdings were sampled (99 total).
- 15 zoos were sampled (15 total).
- 23 shop premises keeping captive birds were sampled (23 total)
- Portugal reported from 7 regions.
- **No positive samples were reported, as in the previous year.**

### ***Slovak Republic***

- Samples were reported from laying hens, chicken breeders, broilers, fattening turkeys, breeder turkeys, ducks/geese, farmed game and ratites. Standard antigens from the CRL were not used in the programme.
- 18 laying hen holdings were sampled from 8 regions (41 total)
- 22 broiler holdings were sampled from 8 regions (124 total).
- 5 chicken breeder holdings were sampled from 5 regions (12 total)
- 5 fattening turkey holdings were sampled from 5 regions (15 total)).
- 7 duck/geese holdings were sampled from 3 regions (15 total).
- 49 game bird holdings were sampled from 6 regions (49 total).
- 28 ratite holdings were sampled from 7 regions (43 total).

- Slovak Republic reported from 8 individual regions.
- **No positive holdings were reported, as in the previous year.**

### ***Slovenia***

- Samples were reported from laying hens, chicken breeders, fattening turkeys, game bird, and ratites.
- 66 laying hen holdings were sampled (139 total).
- 16 chicken breeder holdings were sampled (16 total).
- 72 fattening turkey holdings were sampled (74 total).
- 9 game bird holdings were sampled (9 total).
  - These were reported as:
    - 7 pheasant holdings (7 total)
    - 2 quail holdings (2 total)
- 24 ratite holdings were sampled (41 total).
- Slovenia reported from 1 region.
- **No positive holdings were reported, as in the previous year's survey.**

### ***Spain***

- Samples were reported from laying hens, free range laying hens, broilers, chicken breeders, fattening turkeys, breeder turkeys, ducks and geese, farmed game, ratites and others.
- 519 laying hen holdings were sampled from 19 regions (1,336 total).
  - These were reported as:
    - 478 laying hen holdings were sampled from 16 regions (1,138 total)
    - 41 free range laying hen holdings were sampled from 8 regions (198 total).
- 909 broiler holdings were sampled from 10 regions (5,899 total).
- 201 chicken breeder holdings were sampled from 12 regions (476 total).
- 142 fattening turkey holdings were sampled from 9 (513 total).
- 8 breeder turkey holdings were sampled from 1 region (9 total).
- 217 back-yard flocks were sampled from 8 regions (4,317 total)
- 105 duck/geese holdings were sampled from 11 regions (119 total).
- 198 farmed feathered game holdings were sampled from 15 regions (567 total).
- 71 ratite holdings were sampled from 14 regions (297 total).
- 247 'other' holdings, 36 of which were holdings of pigeon fanciers and breeders, were sampled from 9 regions (525 total).
- Spain reported from 19 regions.
- **1 duck/geese holding was serologically positive for H5 subtype. Virological examination by PCR confirmed H5 subtype.**

- **In 2004-2005 2 ratite holdings were positive for influenza A viruses; one was further identified as subtype H5 and the other subtype H7. 2 'other' holdings were also positive for influenza A viruses and were both further identified as subtype H5.**

### **Sweden**

- Samples were reported from laying hens, layer breeders and broiler breeders , fattening turkeys, breeder turkeys, ducks/geese and ratites.
  - 60 laying hen holdings were sampled (423 total).
  - 40 chicken breeder holdings were sampled (47 total)
    - These were subdivided when submitted as:
      - 11 layer breeders (16 total)
      - 29 broiler breeders (31 total)
  - 35 fattening turkey holdings were sampled (40 total).
  - 4 turkey breeder holdings were sampled (4 total)
  - 23 duck/geese flocks were sampled (37 holdings total).
    - These included reported as:
      - 16 duck flocks from 1 holding were sampled (7 holdings total).
      - 22 geese flocks from 22 holdings were sampled (30 holdings total).
  - 7 ratite holdings were sampled (100 total).
  - Sweden reported as a single region.
  - **No positive holdings were reported, as in the previous year's survey.**

### **The Netherlands**

- Samples were reported from laying hens, broilers, chicken breeders, fattening turkeys, breeder turkeys, ducks and ready to lay pullets.
- 1,167 housed laying hen holdings were sampled (910 total). Reported in Table 1. (Holdings were tested at least once a year).
- 941 broiler holdings were sampled (927 total).
- 1,609 chicken breeder holdings were sampled (411 total).
- 227 fattening turkey holdings were sampled (81 total).
- 14 breeding turkey holdings were sampled (3 total).
- 63 duck holdings were sampled (86 total).
- 1,375 ready to lay pullet holdings were sampled (254 total). These data have been entered in the 'other' category, table 10.
- In several categories the number of holdings sampled exceeded the total number of holdings given; this is because repeated sampling was carried out. As each holding was sampled at least once, the 95% confidence interval for prevalence was calculated based on the total number of holdings given.



- **No positive samples were reported. In 2004-2005 1 free range layer holding was serologically positive for H7 subtype, 3 duck holdings were serologically positive for H5 subtype.**

### ***United Kingdom***

- Samples were reported from laying hens, chicken breeders, fattening turkeys, breeder turkeys, ducks/geese, quails and ratites.
- 90 laying hen holdings were sampled from 2 regions (1290 total GB; total in Northern Ireland not known).
- 57 layer and broiler breeder holdings were sampled from 1 region (509 total).
- 161 fattening turkey holdings were sampled (total not known).
- 27 breeder turkey holdings were sampled from 2 regions (total not known).
- 88 duck/geese holdings were sampled from 2 regions (1632 total GB; total in Northern Ireland not known).
  - 44 duck holdings were sampled from 2 regions (1632 total GB; total in Northern Ireland not known).
  - 43 geese holdings were sampled from 2 regions (575 total GB; total in Northern Ireland not known).
  - 1 duck/geese holding was sampled from 1 region (total not known).
- 4 farmed game (quail) holdings were sampled from 1 region (35 total).
- 11 ratite holdings were sampled from 1 region (36 total).
- The UK reported as a 2 regions (Northern Ireland and Great Britain).
- **1 goose holding was serologically positive for H5 subtype but virologically negative.**

### Analysis by category of poultry

The results are summarised in the following tables:

Laying hens (table 1)

Broilers (table 2)

Chicken breeders (table 3)

Fattening turkeys (table 4)

Turkey breeders (table 5)

Backyard flocks (table 6)

Ducks and geese (table 7)

Game birds (table 8)

Ratites (table 9)

'Others' (table 10)

All the data contained in tables 1-11 is presented graphically in figures 1 to 23.

### Prevalence limits

In tables 1-10, standard epidemiological formulae have been applied to calculate the upper 95% confidence limit for prevalence of positive holdings. An overall summary by Member States is provided (table 11). If all samples were negative, then this value approximates to the highest possible prevalence that is compatible with that result. Where  $\leq 5$  holdings were sampled and all holdings were reported as negative,

a one sided 95% binomial exact confidence interval was calculated. If any of the samples were H5 or H7 positive, this value approximates to the greatest expected prevalence given the observed number of positive holdings. If a Member State reported holdings positive for avian influenza viruses which were not H5 or H7 subtypes, the upper confidence limit is based on a negative result.

These upper confidence limits are based on the national data and have not been adjusted for cluster effect. The denominator used is the reported total number of holdings. However, if the number of holdings in any category or region was not reported then the denominator will have been under-estimated and consequently, the prevalence will have been over-estimated.

If the total number of holdings was not provided by a Member State it was not possible to calculate the upper 95% confidence limit for prevalence. In the Netherlands, where repeated sampling was carried out, the flock prevalence and upper 95% confidence limit for prevalence was calculated based on the total number of holdings. This is because all holdings were sampled at least once during the survey.

Information from some Member States was incomplete and as a result the data are omitted from the tables and figures presented in the report.

### **Key to Figures\*:**

Austria	AT
Belgium	BE
Cyprus	CY
Czech Republic	CZ
Denmark	DK
Estonia	EE
Finland	FI
France	FR
Germany	DE
Greece	GR
Hungary	HU
Irish Republic	IE
Italy	IT
Latvia	LV
Lithuania	LT
Luxembourg	LU
Malta	MT
The Netherlands	NL
Poland	PL
Portugal	PT
Slovak Republic	SK
Slovenia	SI
Spain	ES
Sweden	SE
United Kingdom	UK



**Figure 1. Total number of holdings of all categories by Member State (excluding DE & LT)**

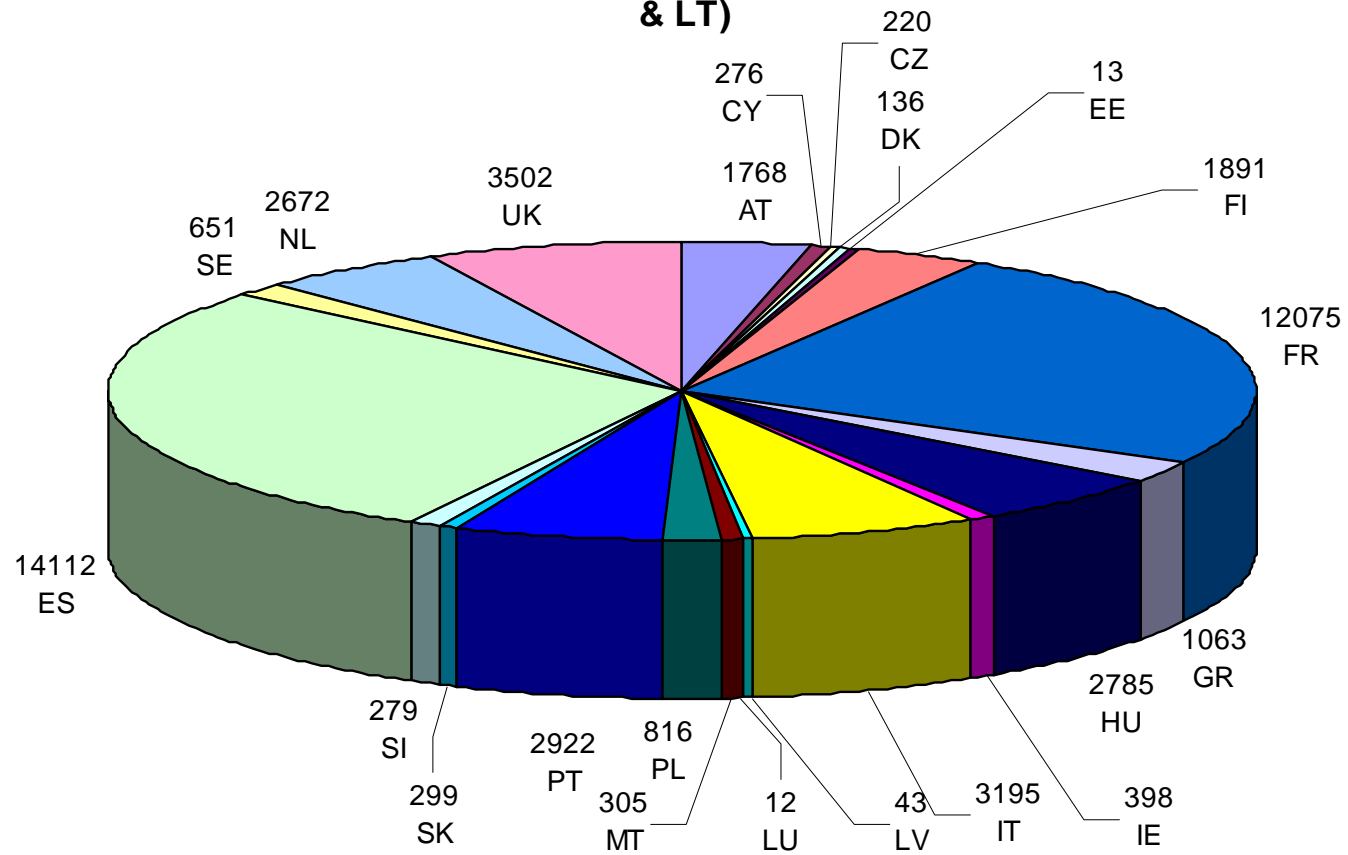
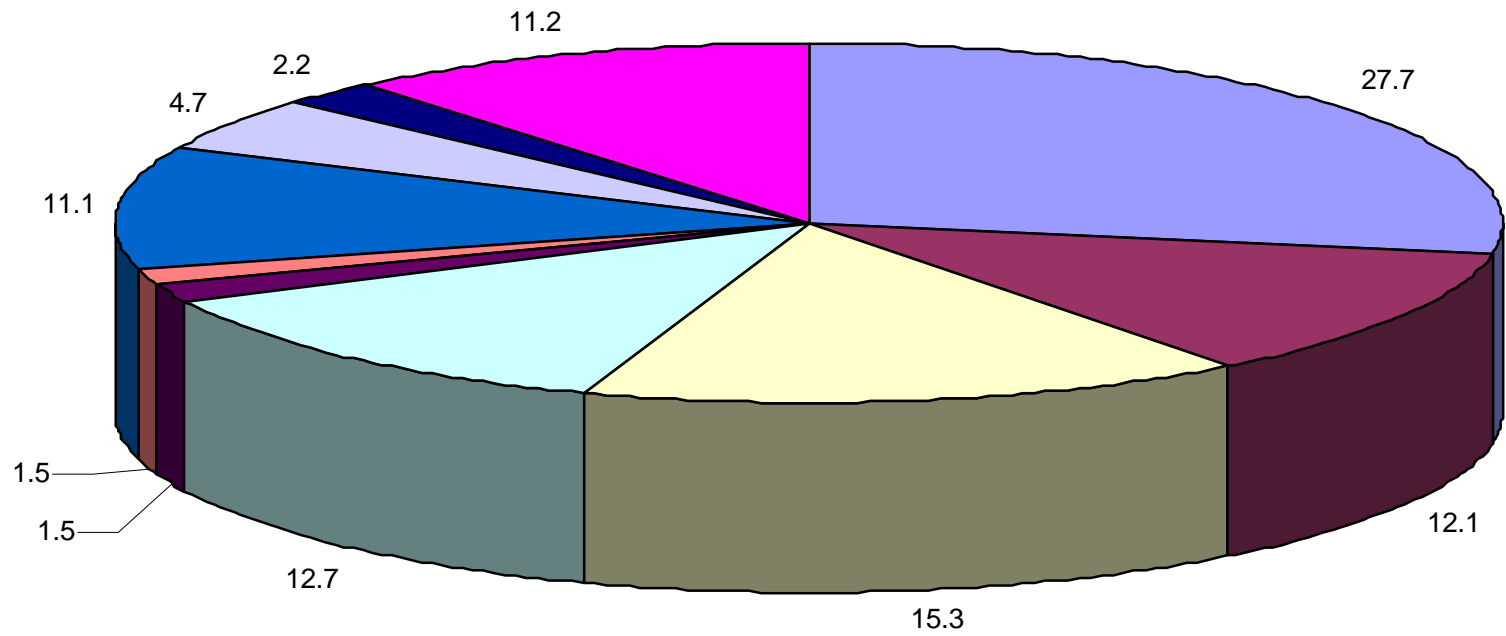


Figure 2. Percentage of categories sampled by holding



- Layers
- Broilers
- Chicken Breeders
- Fattening turkeys
- Breeder turkeys
- Backyard flocks
- Ducks/geese
- Farmed game birds
- Ratites
- Others

Figure 3. Total number of chicken holdings by Member State (excluding DE)

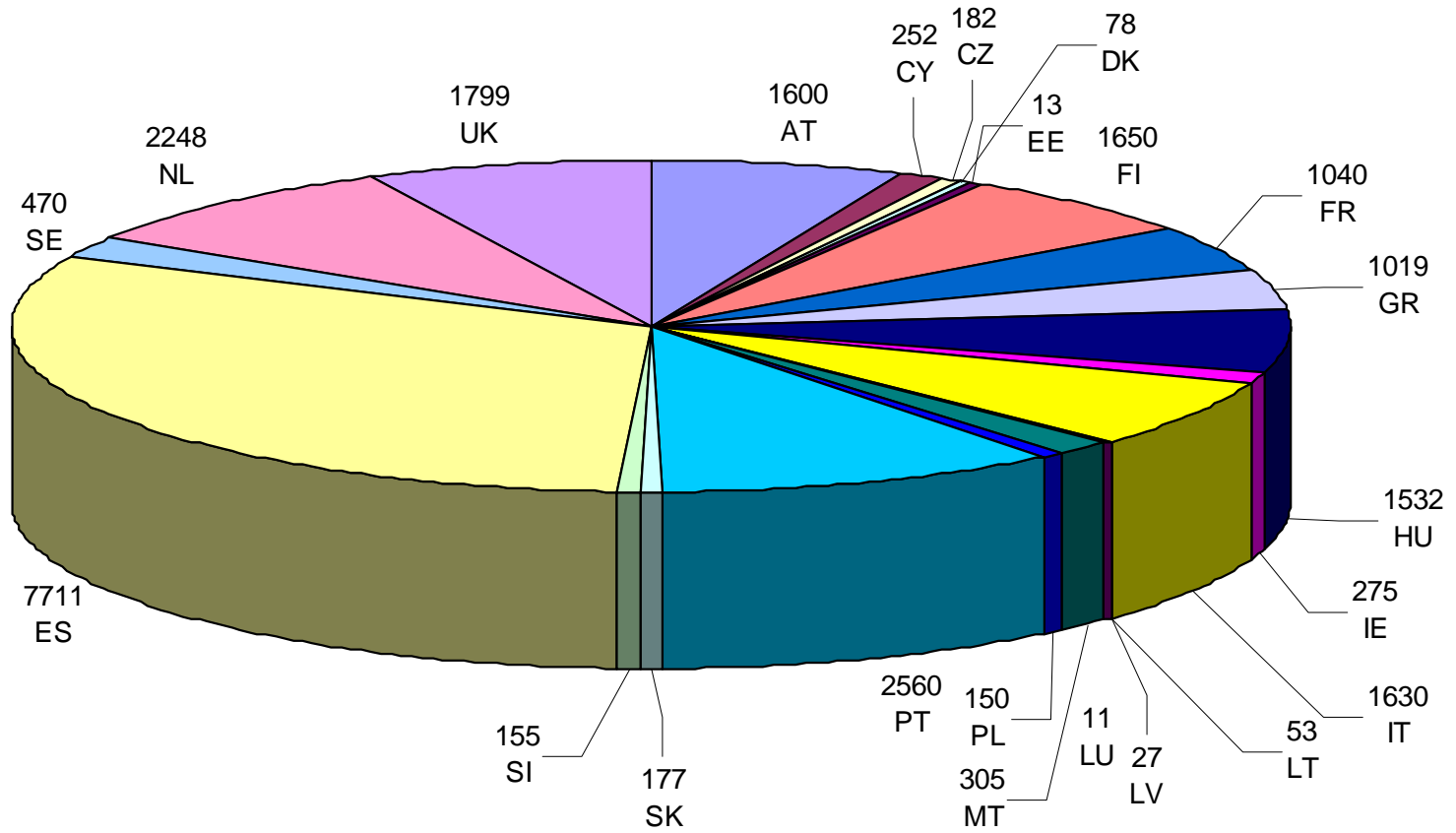
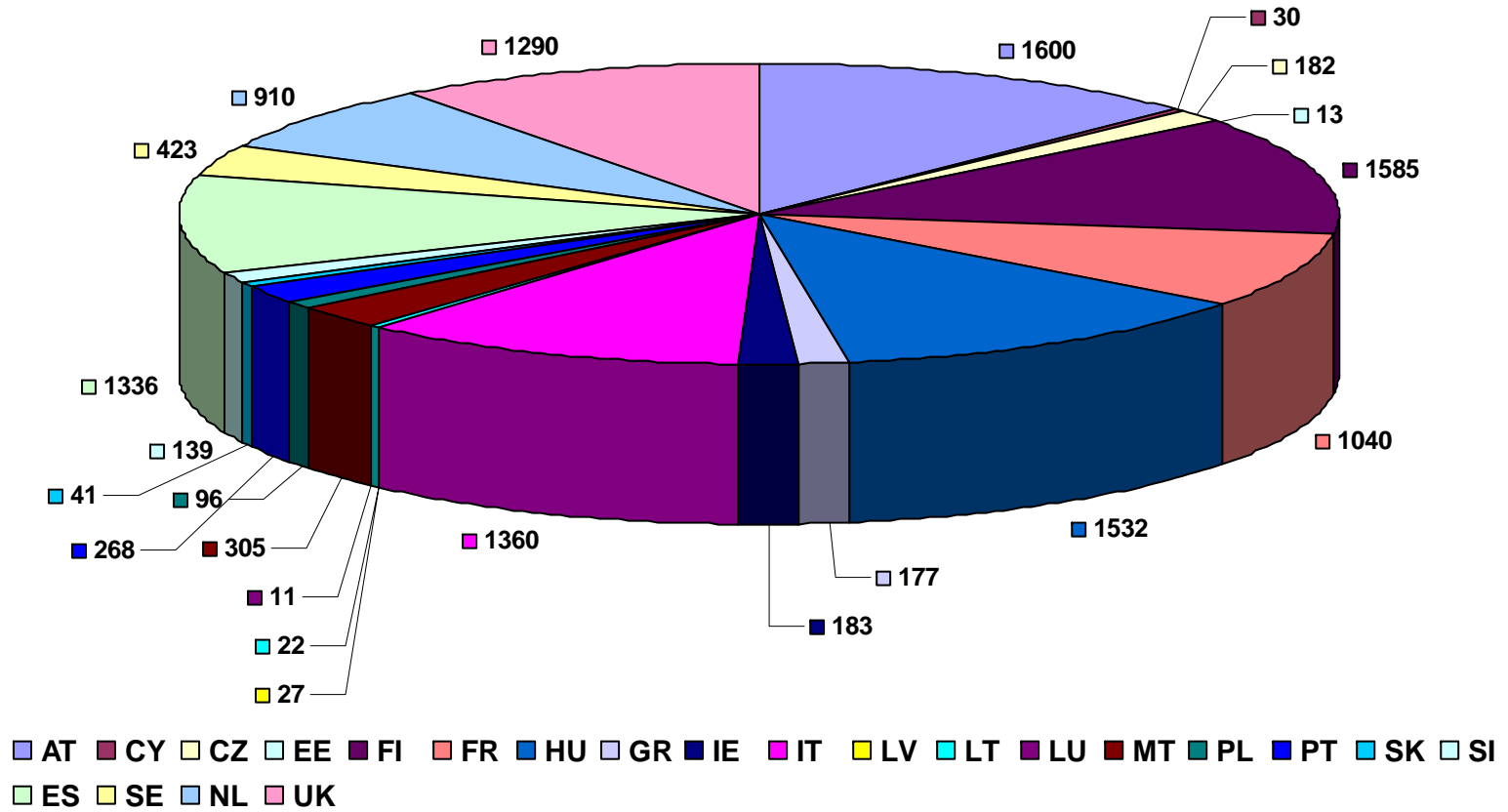


Figure 4: Total number of Laying hen holdings by Member State (excluding DE)





**Figure 5: Total number of Laying hen holdings sampled by Member State**

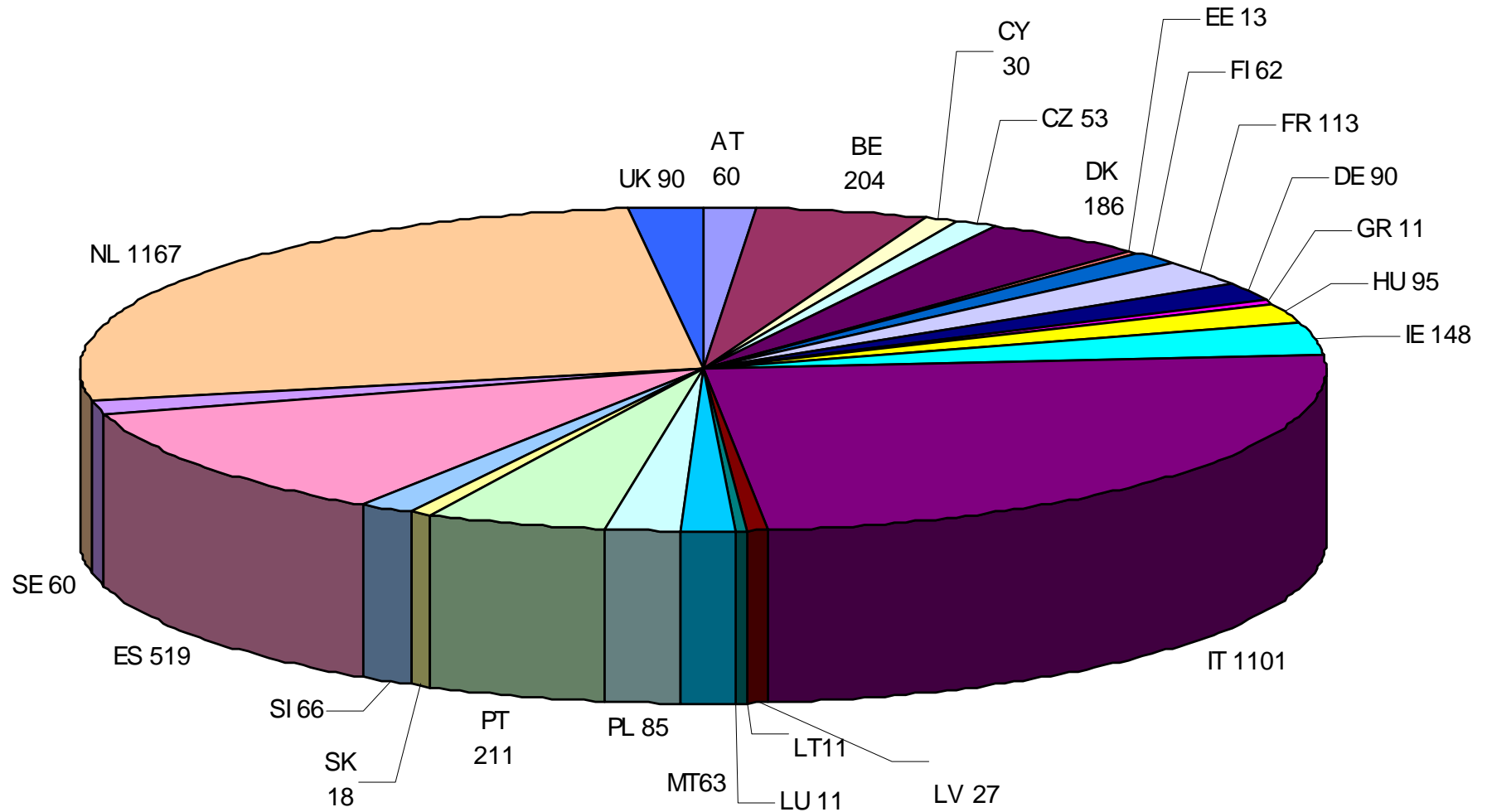
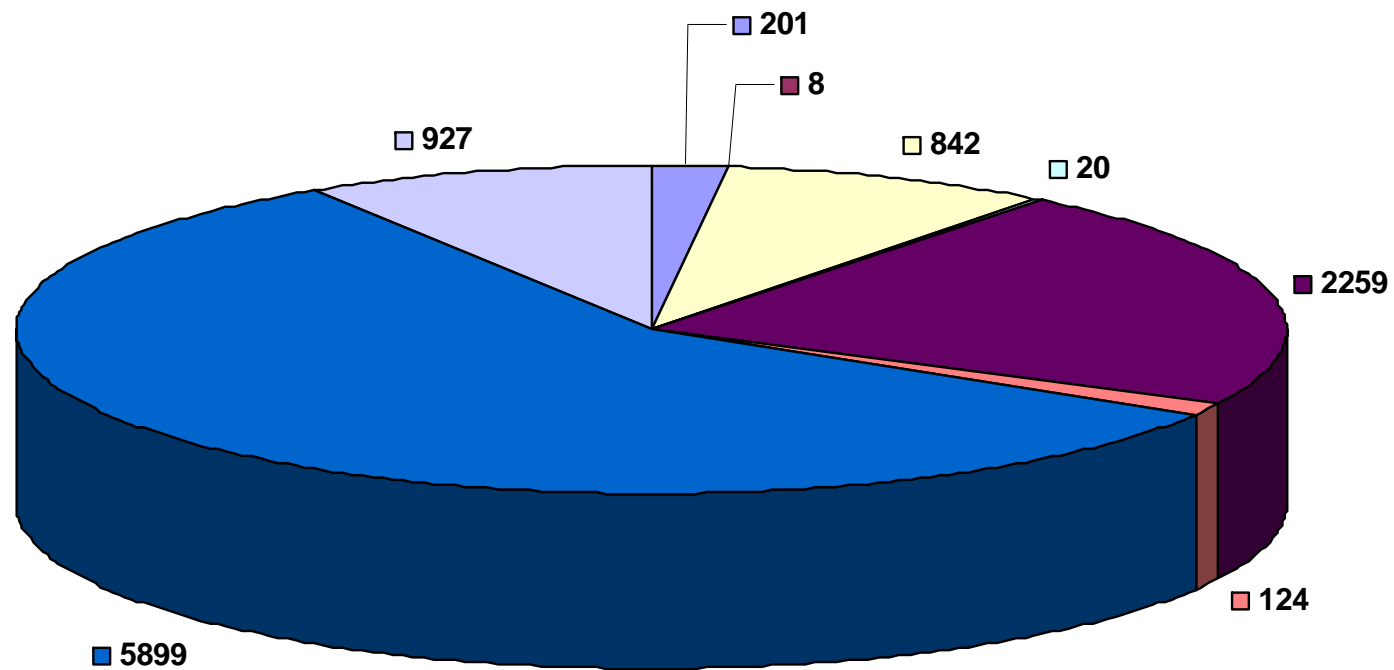


Figure 6: Total Number of Broiler holdings By Member State



■ CY ■ DK ■ GR ■ LT ■ PT ■ SK ■ ES ■ NL

**Table 1. Summary of Serological Survey of Avian Influenza in EU - Laying Hens**

Member State	Number of Regions	Total No. of Holdings	Total No. of Holdings Sampled	Total No. Positive Holdings	No. positive holdings for subtype H5	No. positive holdings for subtype H7	Upper 95% confidence limit for overall Prevalence of H5 & H7
Austria	1	1600	60	0	0	0	4.8%
Belgium	5	-	204	1	1	0	2.7%
Cyprus	1	30	30	0	0	0	8.1%
Czech Republic	1	182	53	0	0	0	5.2%
Denmark*	1	-	186	0	0	0	-
Estonia	15	13	13	0	0	0	18.0%
Finland	1	1585	62	0	0	0	4.7%
France	11	1040	113	0	0	0	2.6%
Germany**	12	87091	90	0	0	0	3.3%
Greece	2	177	11	0	0	0	23.7%
Hungary#	20	1532	95	0	0	0	3.1%
Ireland	8	183	148	0	0	0	1.7%
Italy	20	1360	1101	0	0	0	0.2%
Latvia	16	27	27	0	0	0	9.0%
Lithuania	1	22	11	0	0	0	22.4%
Luxembourg	1	11	11	0	0	0	21.0%
Malta	1	305	63	0	0	0	4.5%
Poland	3	96	85	0	0	0	3.0%
Portugal	7	268	211	0	0	0	1.2%
Slovak Republic	8	41	18	0	0	0	14.4%
Slovenia	1	139	66	0	0	0	4.1%
Spain	19	1336	519	0	0	0	0.5%
Sweden	1	423	60	0	0	0	4.8%
The Netherlands##	1	910	1167	0	0	0	0.3%
UK^	2	1290	90	0	0	0	3.2%
<b>Total</b>	<b>164</b>	<b>99661</b>	<b>4494</b>	<b>1</b>	<b>1</b>	<b>0</b>	

\* The total number of holdings was not reported, therefore the upper 95% limit for prevalence cannot be calculated.

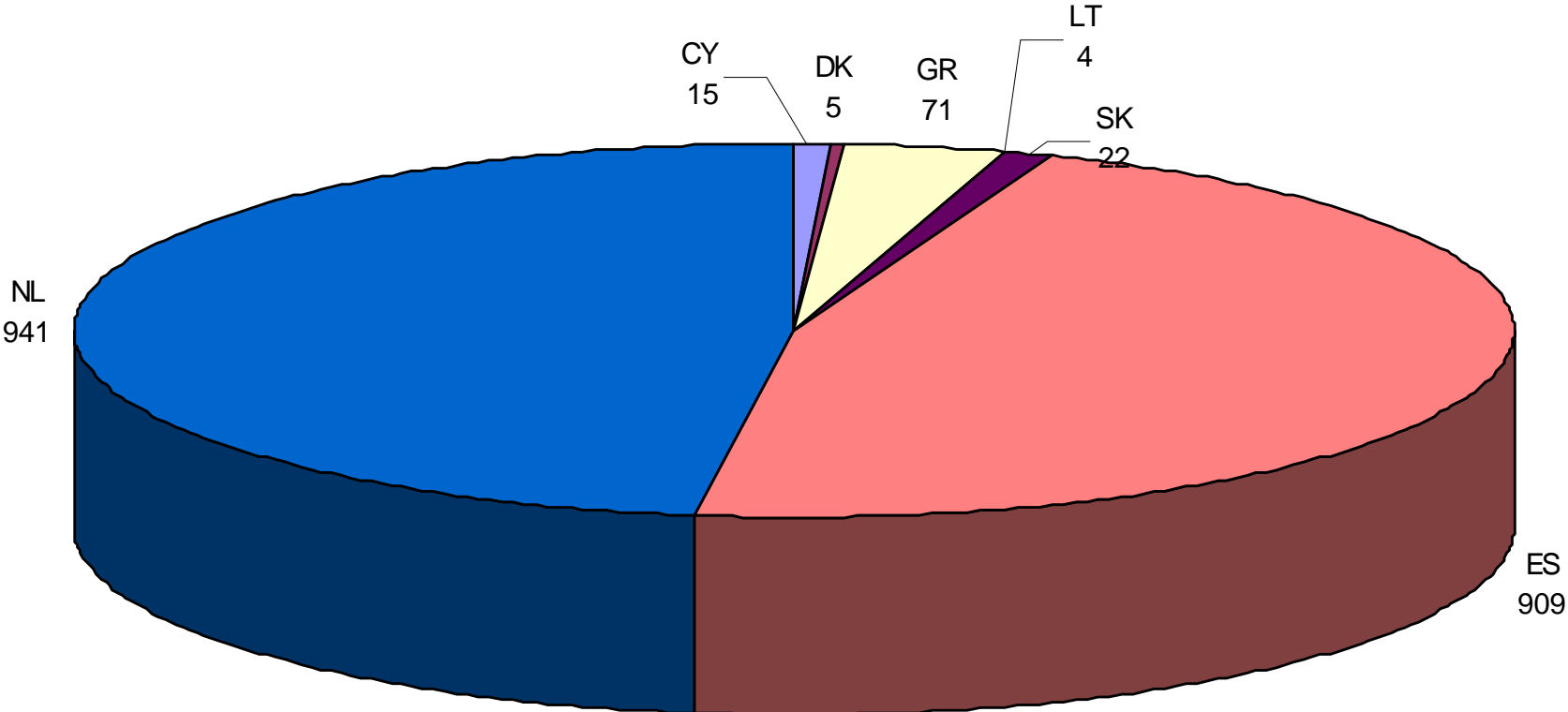
\*\* 90/87091 "chicken" holdings were sampled - no reliable stratification was available.

# 95/1532 holdings of "Gallus gallus, (breeding flocks and table egg layer holdings)" were sampled.

## Each holding was sampled at least once during the survey, therefore the upper 95% limit for prevalence has been based on 910 holdings.

^ The total number of holdings for the UK was not known: 1290 holdings were reported from GB; the total in NI was not known.

Figure 7: Total number of Broiler holdings sampled by Member State



**Table 2. Summary of Serological Survey of Avian Influenza in EU – Broilers\***

Member State	Number of Regions	Total No. of Holdings	Total No. of Holdings Sampled	Total No. Positive Holdings	No. positive holdings for subtype H5	No. positive holdings for subtype H7	Upper 95% confidence limit for overall Prevalence of H5 & H7
Austria	-	-	-	-	-	-	-
Belgium	-	-	-	-	-	-	-
Cyprus	1	201	15	0	0	0	17.9%
Czech Republic	-	-	-	-	-	-	-
Denmark	1	8	5	0	0	0	45.1%
Estonia	-	-	-	-	-	-	-
Finland	-	-	-	-	-	-	-
France	-	-	-	-	-	-	-
Germany	-	-	-	-	-	-	-
Greece	5	842	71	0	0	0	4.1%
Hungary	-	-	-	-	-	-	-
Ireland	-	-	-	-	-	-	-
Italy	-	-	-	-	-	-	-
Latvia	-	-	-	-	-	-	-
Lithuania	1	20	4	0	0	0	52.7%
Luxembourg	-	-	-	-	-	-	-
Malta	-	-	-	-	-	-	-
Poland	-	-	-	-	-	-	-
Portugal	7	2259	-	-	-	-	-
Slovak Republic	8	124	22	0	0	0	12.4%
Slovenia	-	-	-	-	-	-	-
Spain	10	5899	909	0	0	0	0.3%
Sweden	-	-	-	-	-	-	-
The Netherlands**	1	927	941	0	0	0	0.3%
UK	-	-	-	-	-	-	-
Total	34	10280	1967	0	0	0	

\* The serological testing of broilers was not mandatory for the 2005 survey.

\*\* Each holding was sampled at least once during the survey, therefore the upper 95% limit for prevalence has been based on 927 holdings.

**Figure 8. Total number of chicken breeders by Member State**

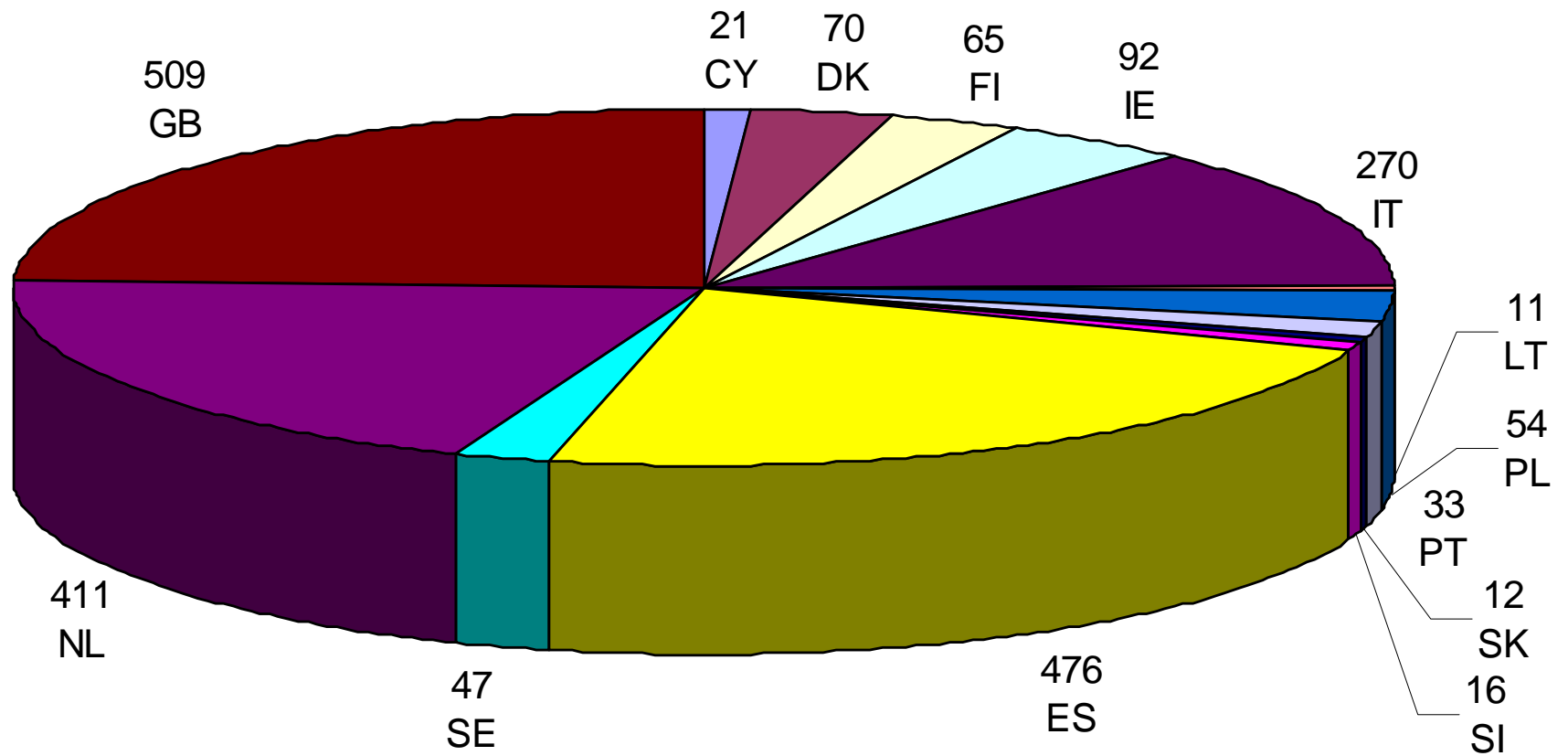
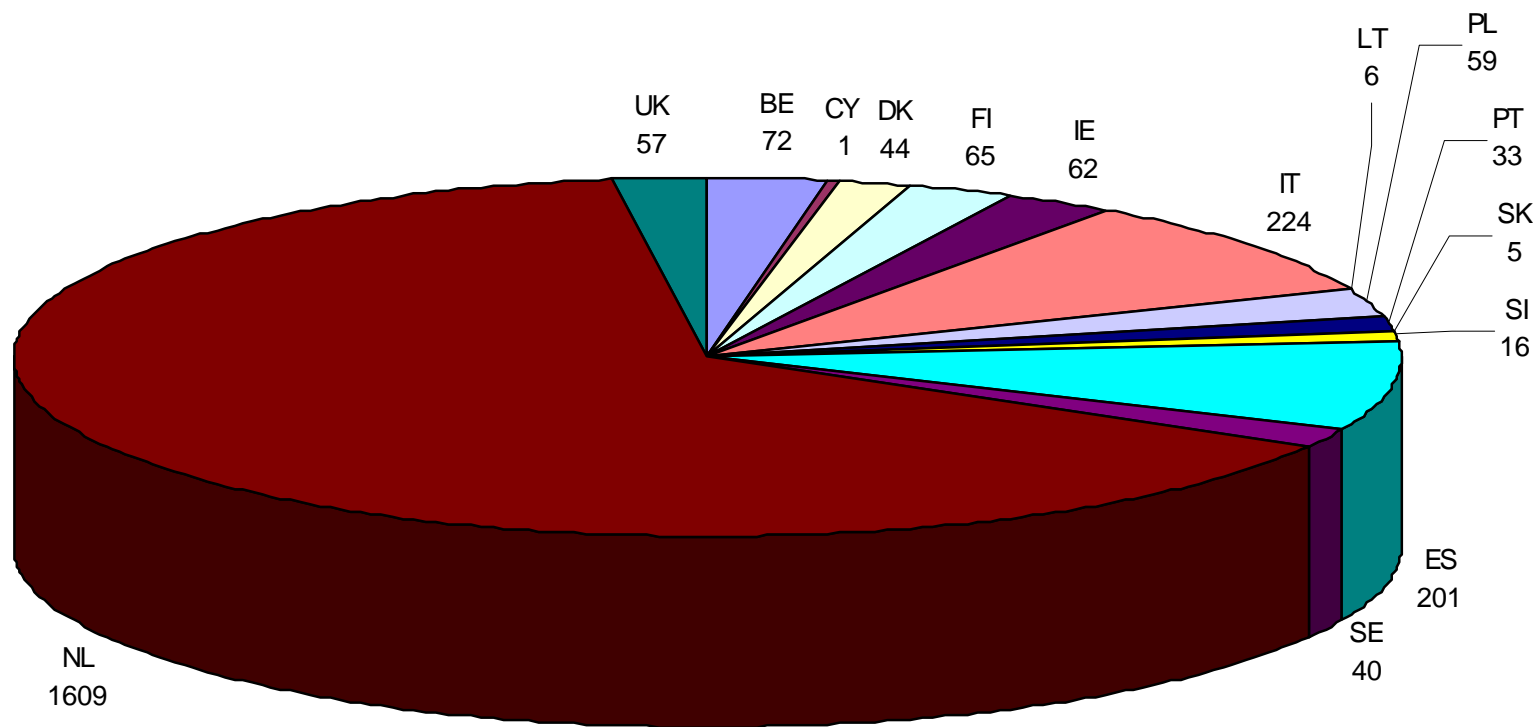


Figure 9: Total number of Chicken breeder holdings sampled by Member State



**Table 3. Summary of Serological Survey of Avian Influenza in EU - Chicken Breeders**

Member State	Number of Regions	Total No. of Holdings	Total No. of Holdings Sampled	Total No. Positive Holdings	No. positive holdings for subtype H5	No. positive holdings for subtype H7	Upper 95% confidence limit for overall Prevalence of H5 & H7
Austria	-	-	-	-	-	-	-
Belgium	5	NK	72	3	2	1	11.7%
Cyprus	1	21	1	0	0	0	95.0%
Czech Republic	-	-	-	-	-	-	-
Denmark	1	70	44	0	0	0	5.9%
Estonia	-	-	-	-	-	-	-
Finland	1	65	65	0	0	0	3.8%
France	-	-	-	-	-	-	-
Germany	-	-	-	-	-	-	-
Greece	-	-	-	-	-	-	-
Hungary	-	-	-	-	-	-	-
Ireland	8	92	62	0	0	0	4.2%
Italy	20	270	224	0	0	0	1.1%
Latvia	-	-	-	-	-	-	-
Lithuania	1	11	6	0	0	0	37.7%
Luxembourg	-	-	-	-	-	-	-
Malta	-	-	-	-	-	-	-
Poland	3	54	54	0	0	0	4.2%
Portugal	7	33	33	0	0	0	7.4%
Slovak Republic	8	12	5	0	0	0	45.1%
Slovenia	1	16	16	0	0	0	14.8%
Spain	12	476	201	0	0	0	1.4%
Sweden	1	47	40	0	0	0	6.3%
The Netherlands*	1	411	1609	0	0	0	0.7%
UK**	2	509	57	0	0	0	5.0%
<b>Total</b>	<b>72</b>	<b>2087</b>	<b>2489</b>	<b>3</b>	<b>2</b>	<b>1</b>	

\* Each holding was sampled at least once during the survey, therefore the upper 95% limit for prevalence has been based on 411 holdings.

\*\* The total number of holdings for the UK was not known: 509 holdings were reported from GB; the total in NI was not known.



Figure 10: Total number of Turkey holdings (fatteners & breeders) by Member State

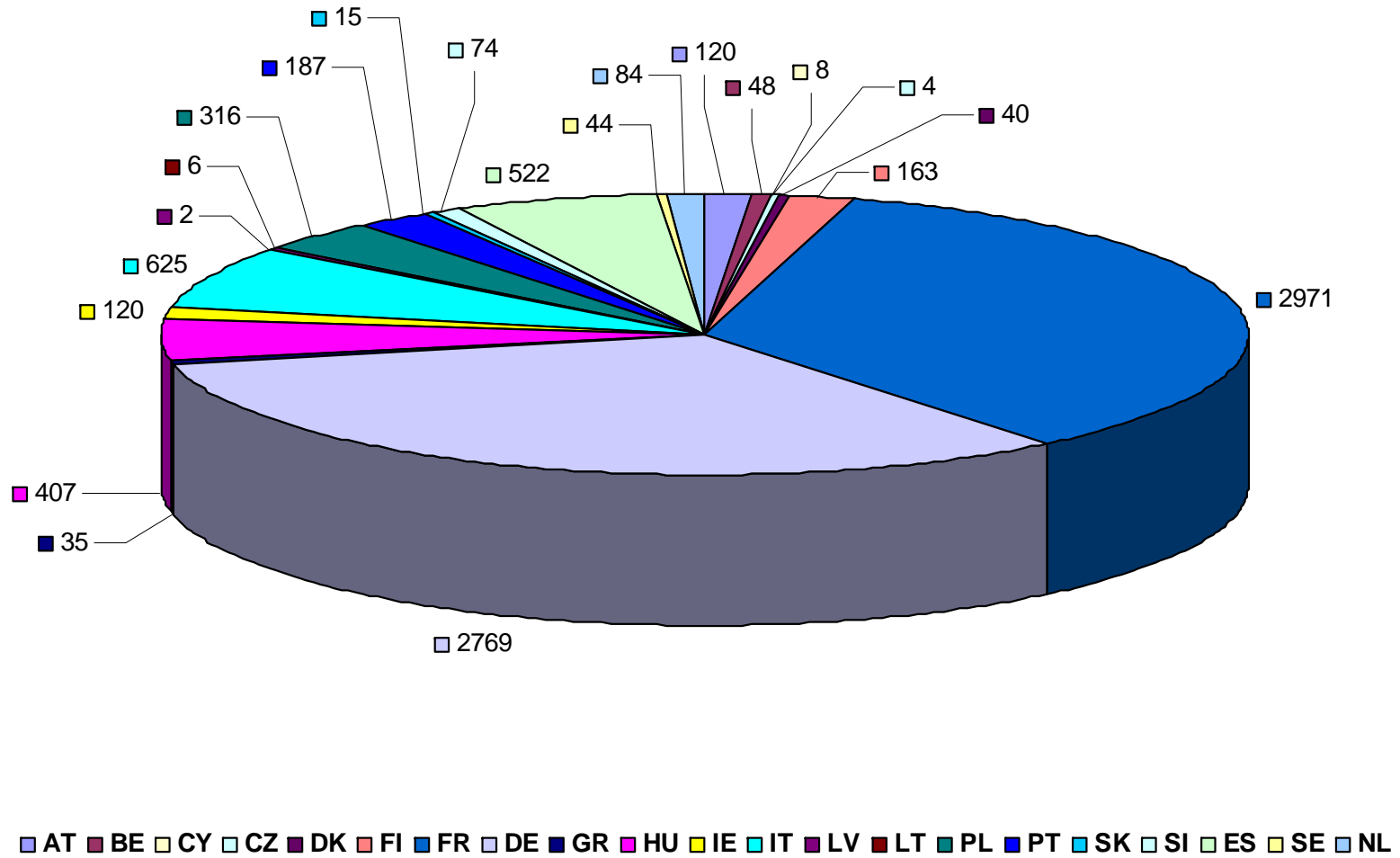


Figure11: Total number of Fattening turkey holdings by Member State

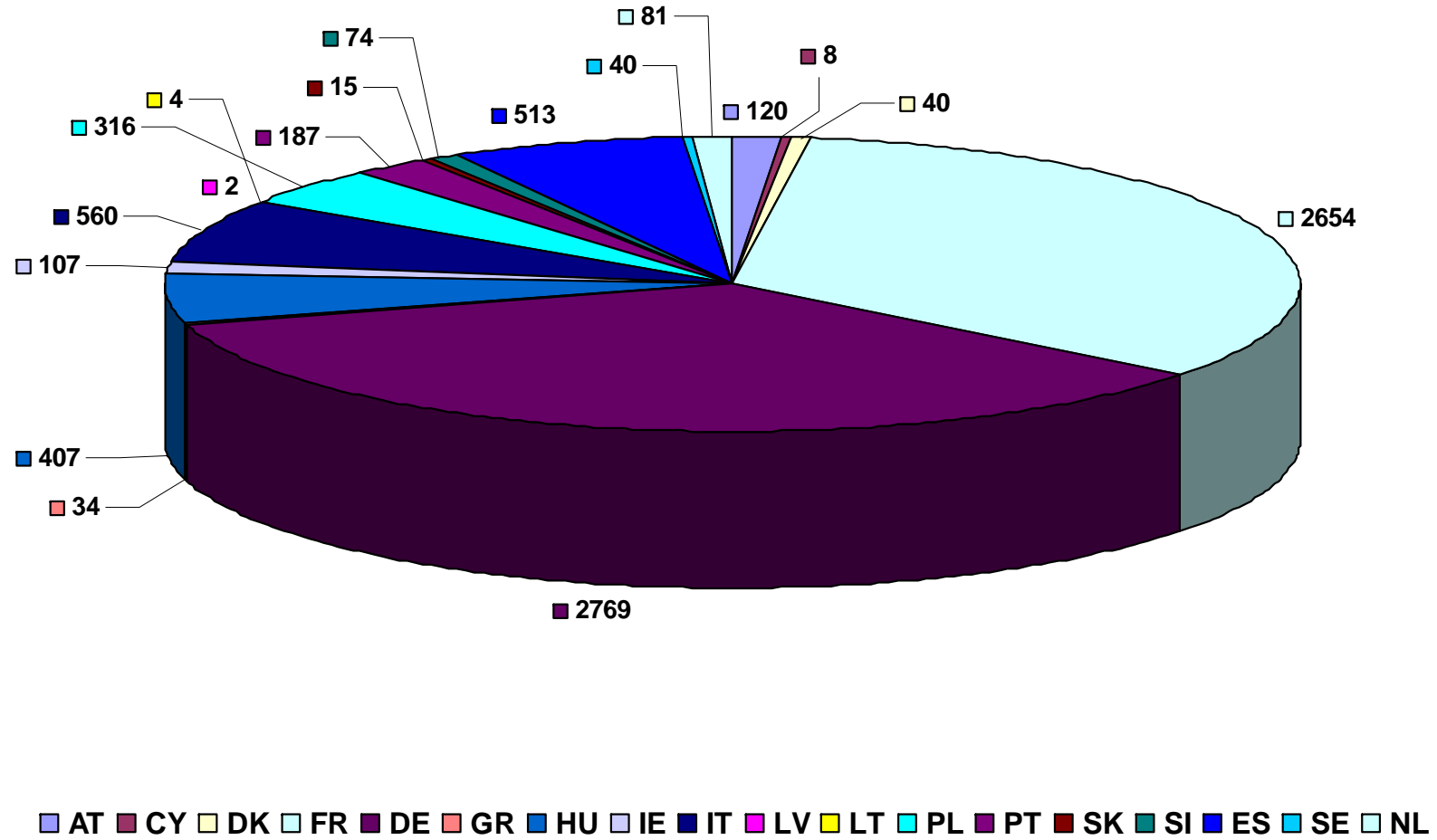
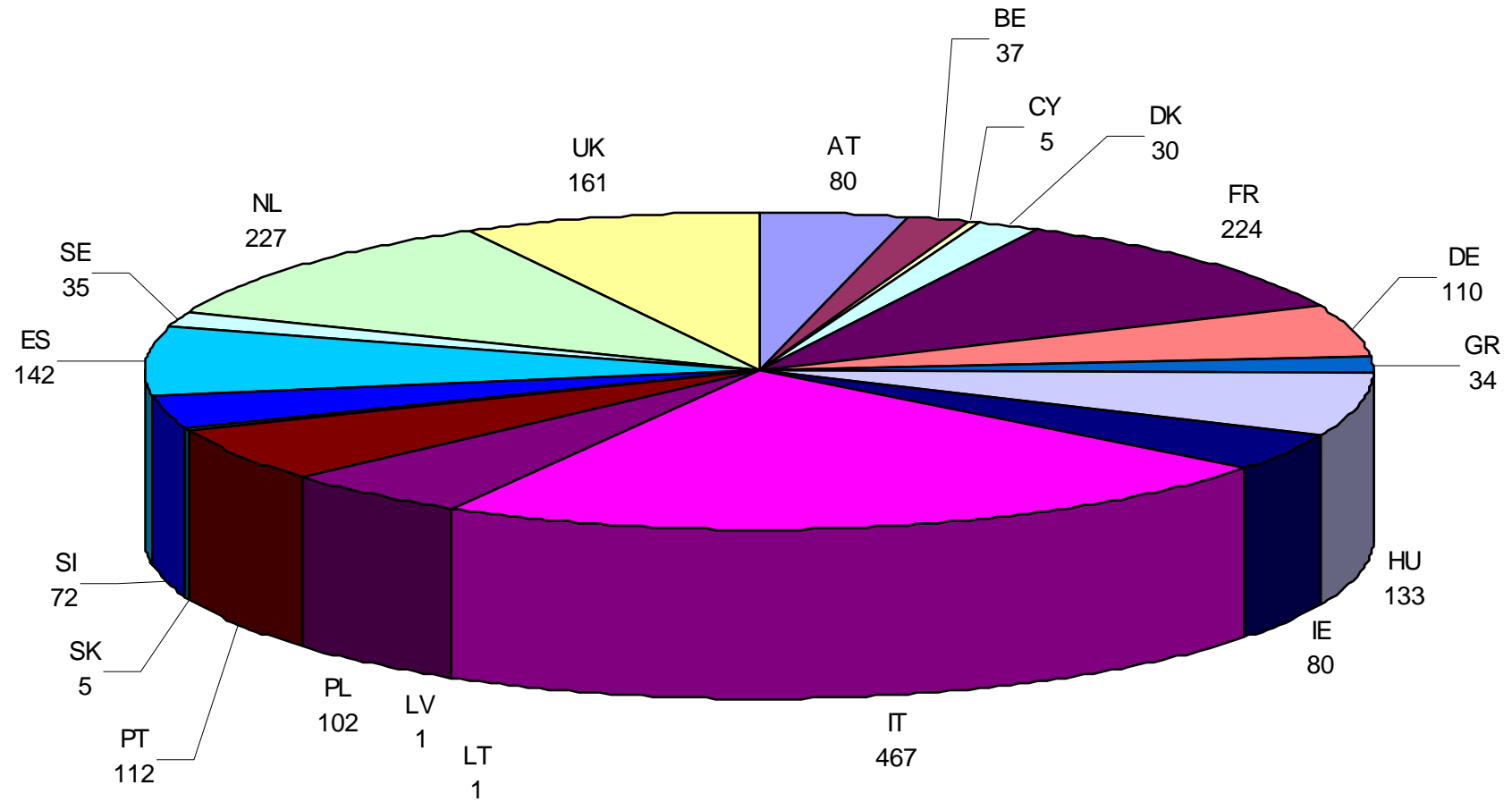


Figure12: Total number of Fattening turkey holdings sampled



**Table 4. Summary of Serological Survey of Avian Influenza in EU - Fattening Turkeys**

Member State	Number of Regions	Total No. of Holdings	Total No. of Holdings Sampled	Total No. Positive Holdings	No. positive holdings for subtype H5	No. positive holdings for subtype H7	Upper 95% confidence limit for overall Prevalence of H5 & H7
Austria	1	120	80	0	0	0	3.3%
Belgium*	5	-	37	0	0	0	-
Cyprus	1	8	5	0	0	0	45.1%
Czech Republic	-	-	-	-	-	-	-
Denmark	1	40	30	0	0	0	8.4%
Estonia	-	-	-	-	-	-	-
Finland	-	-	-	-	-	-	-
France	10	2654	224	3	0	0	1.3%
Germany**	12	2769	110	0	0	0	2.7%
Greece	7	35	34	0	0	0	7.2%
Hungary <sup>#</sup>	20	407	133	0	0	0	2.1%
Ireland	8	107	80	0	0	0	3.2%
Italy	20	560	467	0	0	0	0.6%
Latvia	2	2	1	0	0	0	95.0%
Lithuania	1	4	1	0	0	0	95.0%
Luxembourg	-	-	-	-	-	-	-
Malta	-	-	-	-	-	-	-
Poland <sup>##</sup>	3	316	102	0	0	0	2.7%
Portugal	7	187	112	0	0	0	2.4%
Slovak Republic	8	15	5	0	0	0	45.1%
Slovenia	1	74	72	0	0	0	3.4%
Spain	9	513	142	0	0	0	2.0%
Sweden	1	40	35	0	0	0	7.1%
The Netherlands <sup>^</sup>	1	81	227	0	0	0	3.6%
UK*	2	-	161	0	0	0	-
<b>Total</b>	<b>120</b>	<b>7932</b>	<b>2058</b>	<b>3</b>	<b>0</b>	<b>0</b>	

\* The total number of fattening turkey holdings was not reported, therefore the upper 95% limit for prevalence cannot be calculated.

\*\* "110/2769 Turkey (no reliable stratification available)" reported as Fattening turkeys.

<sup>#</sup> 133/407 Turkeys (breeding flocks and broiler holdings), reported as Fattening Turkeys.

<sup>##</sup> 102/316 "Turkey holdings sampled", reported as Fattening Turkeys.

<sup>^</sup> Each holding was sampled at least once during the survey, therefore the upper 95% limit for prevalence has been based on 81 holdings.

**Figure 13: Total number of Turkey breeder holdings by Member State**

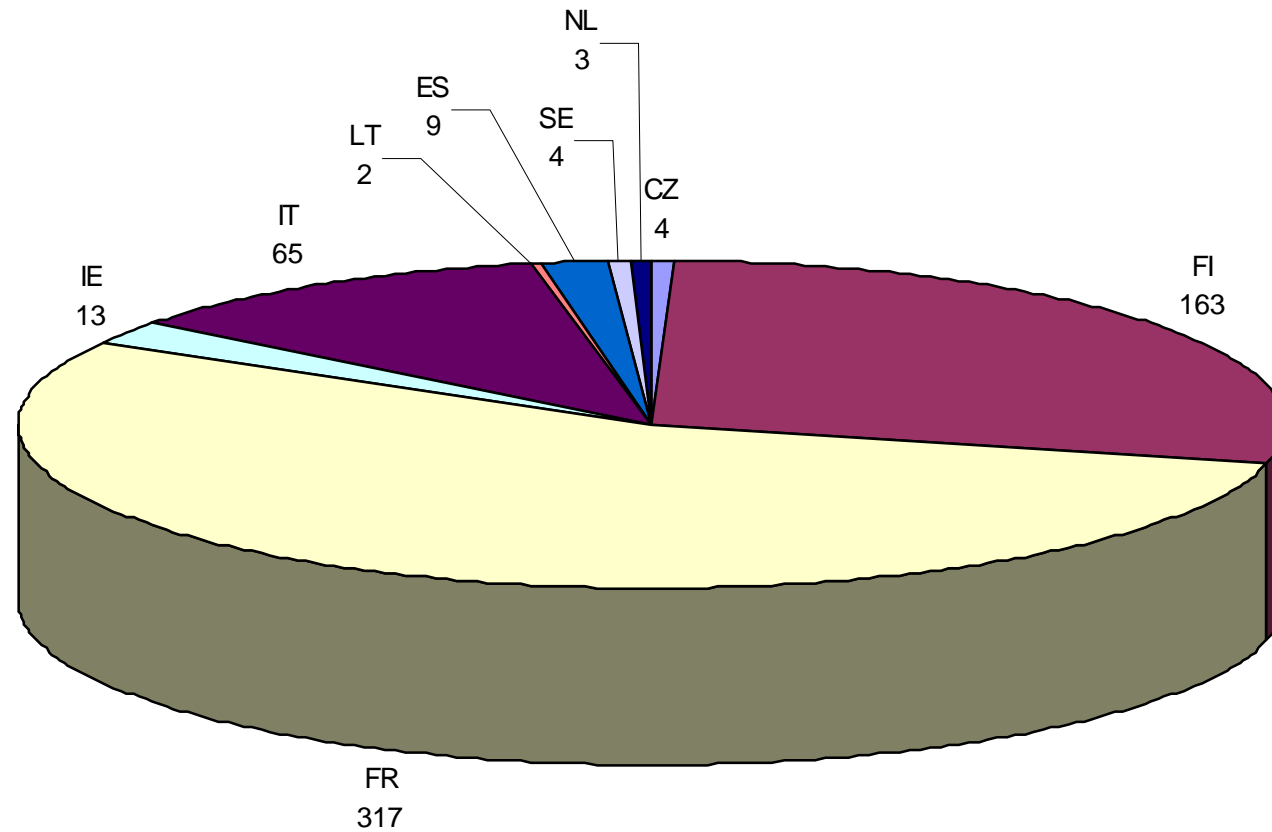
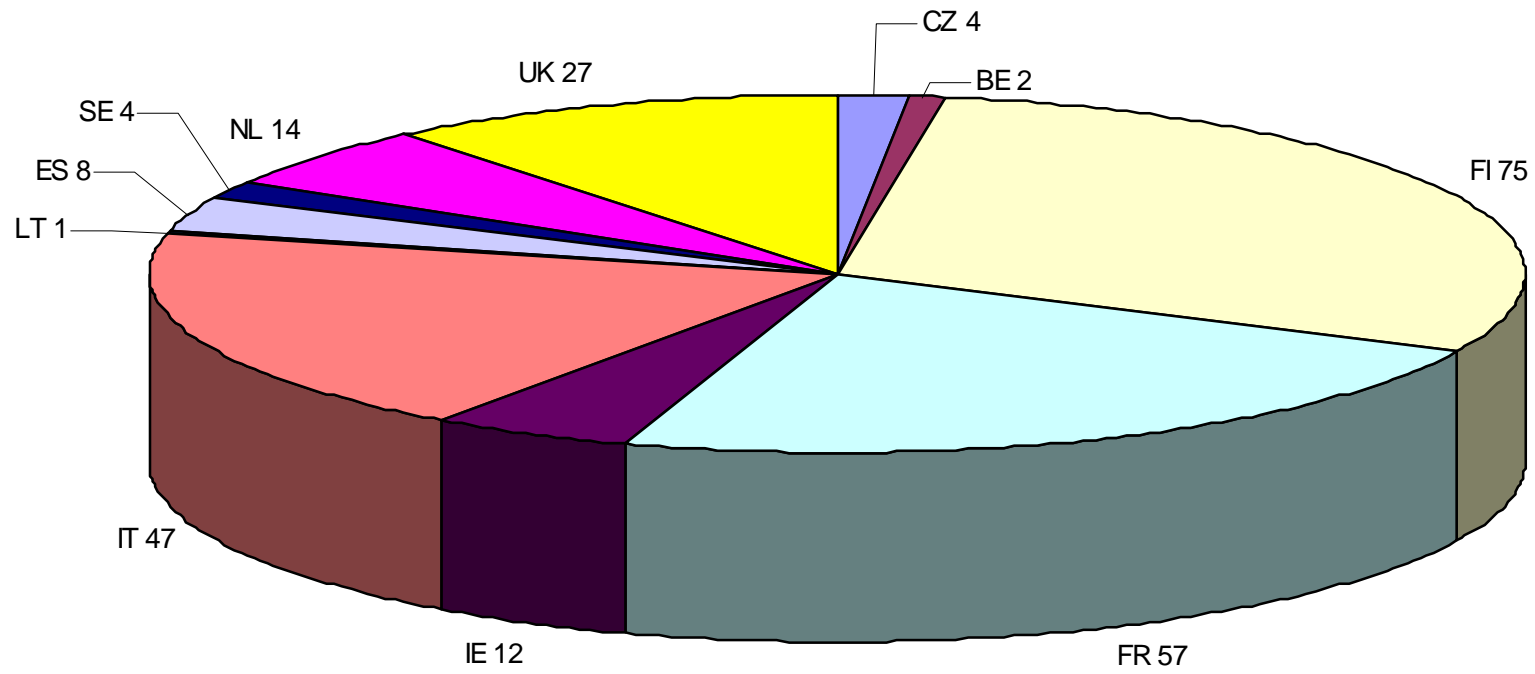


Figure 14: Total number of Turkey breeder holdings sampled by Member State



**Table 5. Summary of Serological Survey of Avian Influenza in EU - Breeder Turkeys**

Member State	Number of Regions	Total No. of Holdings	Total No. of Holdings Sampled	Total No. Positive Holdings	No. positive holdings for subtype H5	No. positive holdings for subtype H7	Upper 95% confidence limit for Prevalence of H5 & H7
Austria	-	-	-	-	-	-	-
Belgium	3	-	2	0	0	0	77.6%
Cyprus	-	-	-	-	-	-	-
Czech Republic	1	4	4	0	0	0	52.7%
Denmark	-	-	-	-	-	-	-
Estonia	-	-	-	-	-	-	-
Finland	1	163	75	0	0	0	3.6%
France	2	317	57	0	0	0	5.0%
Germany	-	-	-	-	-	-	-
Greece	-	-	-	-	-	-	-
Hungary	-	-	-	-	-	-	-
Ireland	8	13	12	0	0	0	19.6%
Italy	20	65	47	0	0	0	5.5%
Latvia	-	-	-	-	-	-	-
Lithuania	1	2	1	0	0	0	95.0%
Luxembourg	-	-	-	-	-	-	-
Malta	-	-	-	-	-	-	-
Poland	-	-	-	-	-	-	-
Portugal	-	-	-	-	-	-	-
Slovak Republic	-	-	-	-	-	-	-
Slovenia	-	-	-	-	-	-	-
Spain	1	9	8	0	0	0	28.5%
Sweden	1	4	4	0	0	0	52.7%
The Netherlands*	1	3	14	0	0	0	63.2%
UK**	2	-	27	0	0	0	-
	41	580	251	0	0	0	

\* Each holding was sampled at least once during the survey, therefore the upper 95% limit for prevalence has been based on 3 holdings.

\*\* The total number of holdings was not reported, therefore the upper 95% limit for prevalence cannot be calculated.

**Table 6. Summary of Serological Survey of Avian Influenza in EU - Backyard Flocks**

Member State	Number of Regions	Total No. of Holdings	Total No. of serological tested Holdings	Total No. serological positive holdings	No. serological positive holdings for subtype H5	No. serological positive holdings for subtype H7	Upper 95% confidence limit for Prevalence of H5 & H7
Austria	-	-	-	-	-	-	-
Belgium	-	-	-	-	-	-	-
Cyprus*	1	<b>9034</b>	13	0	0	0	-
Czech Republic	-	-	-	-	-	-	-
Denmark	-	-	-	-	-	-	-
Estonia	-	-	-	-	-	-	-
Finland	-	-	-	-	-	-	-
France	-	-	-	-	-	-	-
Germany	-	-	-	-	-	-	-
Greece	-	-	-	-	-	-	-
Hungary	-	-	-	-	-	-	-
Ireland	-	-	-	-	-	-	-
Italy	-	-	-	-	-	-	-
Latvia	-	-	-	-	-	-	-
Lithuania	1	174213	17	0	0	0	0.0
Luxembourg	-	-	-	-	-	-	-
Malta	-	-	-	-	-	-	-
Poland	-	-	-	-	-	-	-
Portugal	-	-	-	-	-	-	-
Slovak Republic	-	-	-	-	-	-	-
Slovenia	-	-	-	-	-	-	-
Spain	19	4371	217	0	0	0	0.0
Sweden	-	-	-	-	-	-	-
The Netherlands	-	-	-	-	-	-	-
UK	-	-	-	-	-	-	-
<b>Total</b>	<b>21</b>	<b>178584</b>	<b>247</b>	<b>0</b>	<b>0</b>	<b>0</b>	

\* The total number of holdings was not reported, therefore the upper 95% limit for prevalence cannot be calculated.



Figure 15. total number of backyard flocks by Member State

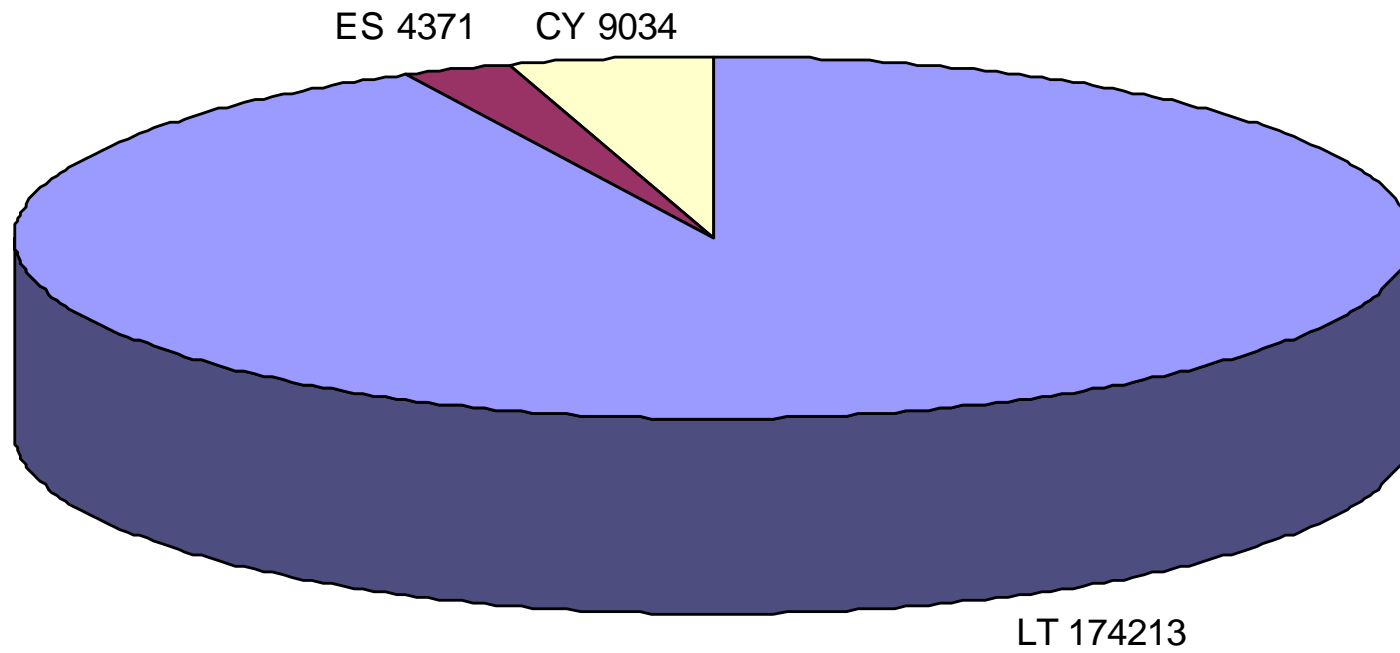


Figure 16. Total number of backyard flocks sampled by Member States

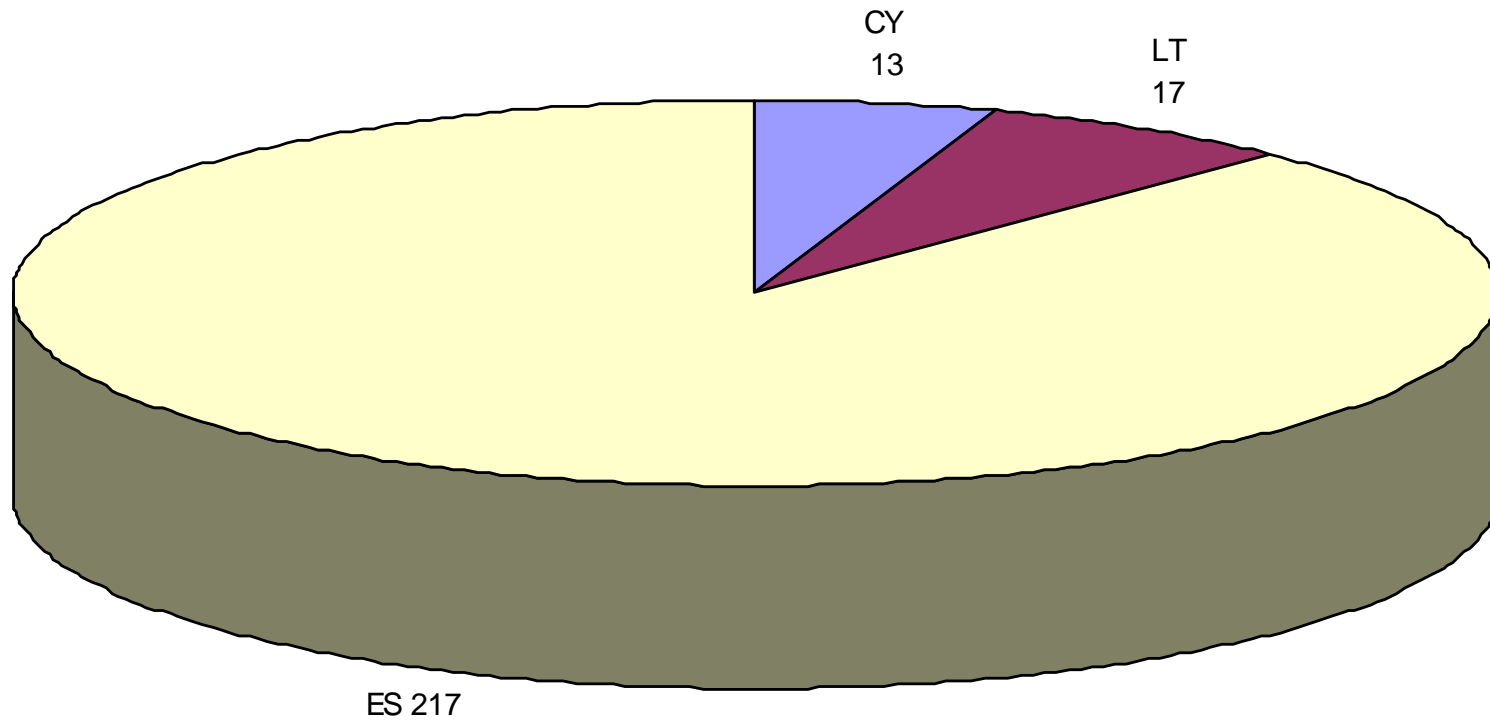


Figure 17: Total number of duck/geese holdings by Member State

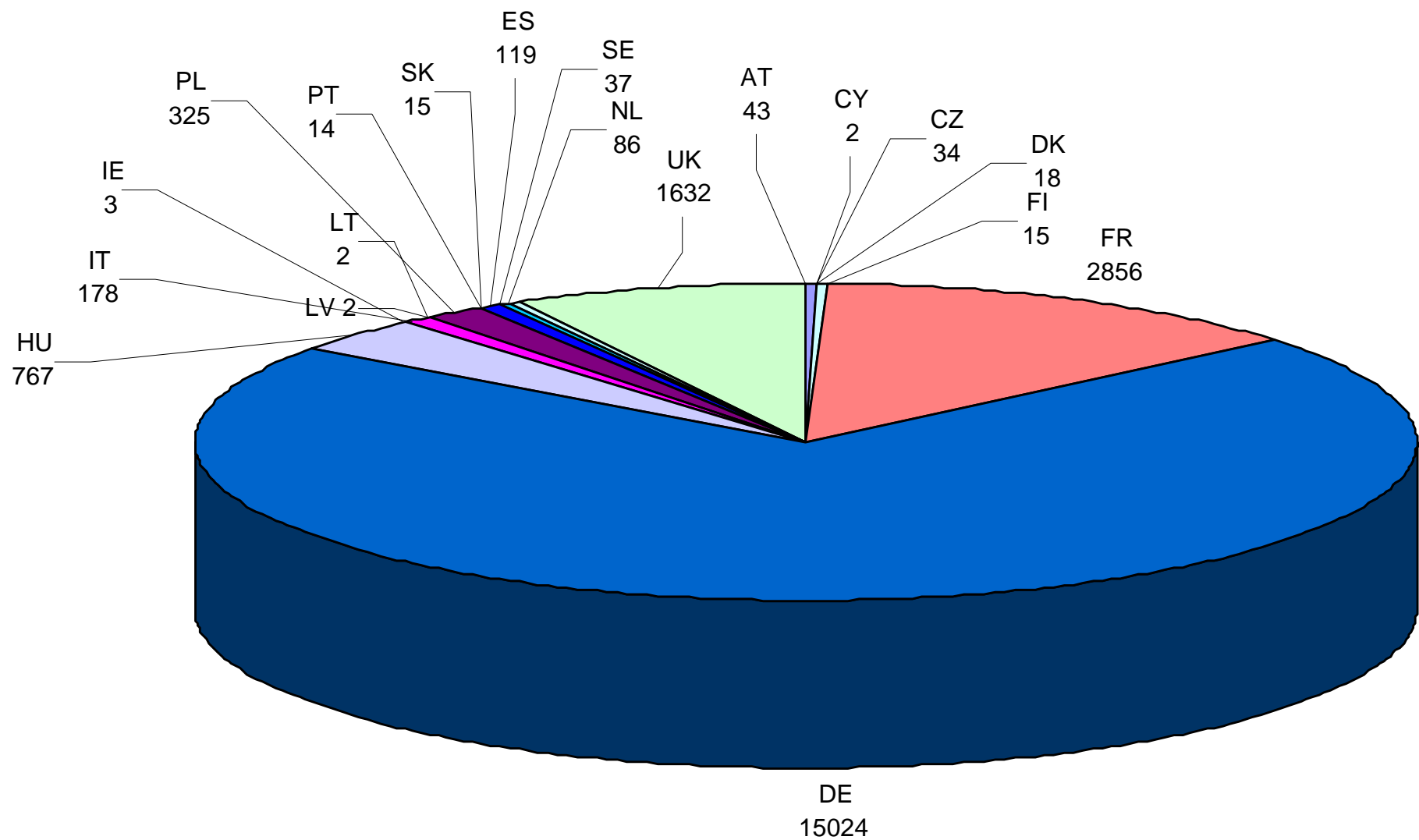
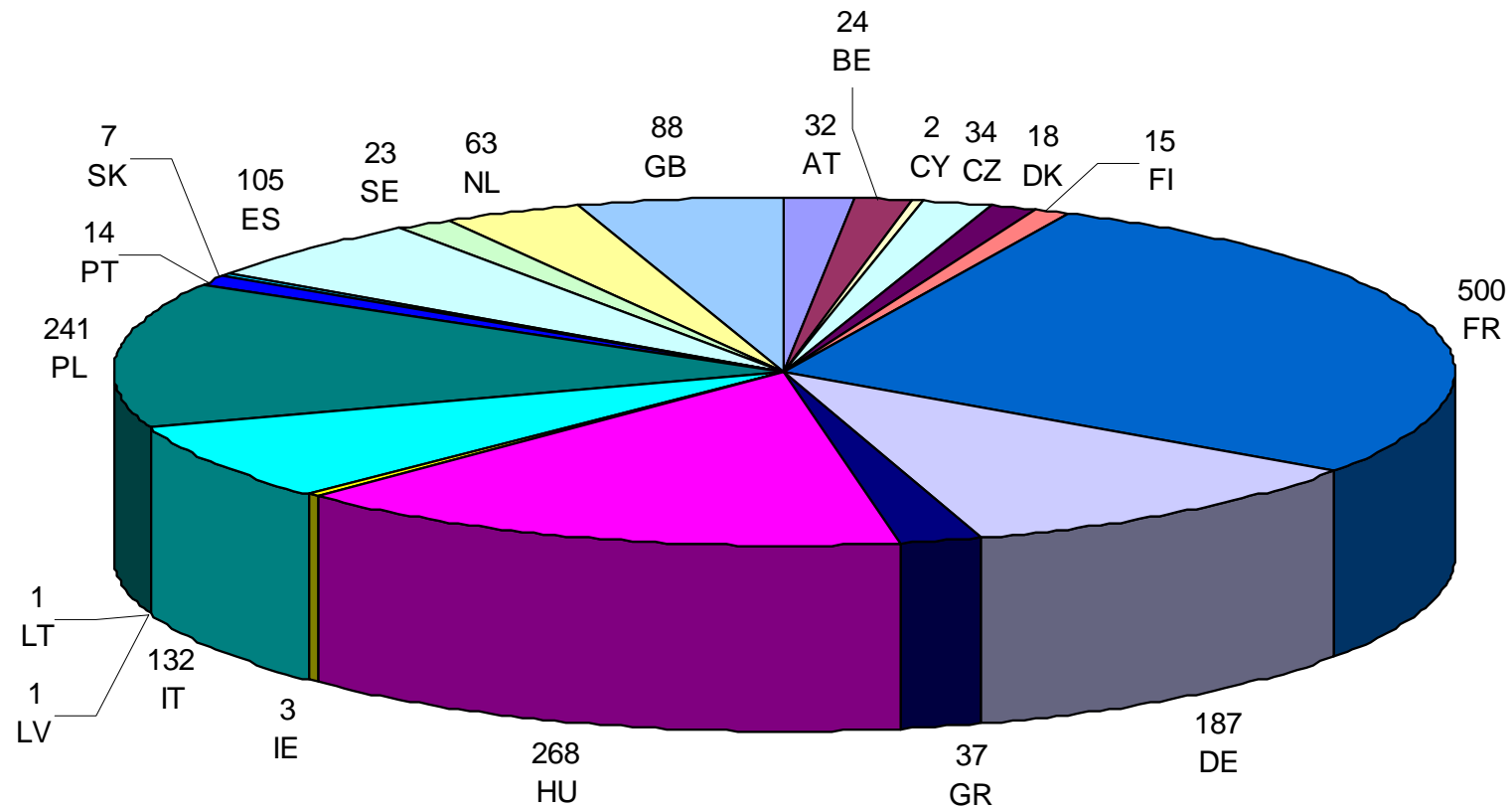


Figure 18. Total number of ducks and geese holdings sampled by Member States



**Table 7. Summary of Virological Survey of Avian Influenza in EU – Ducks/geese**

Member State	Number of Regions	Total No. of Holdings	Total No. of Holdings Sampled	Total No. of virological Positive Holdings	No. of virological positive holdings for subtype H 5	No. of virological positive holdings for subtype H 7	Total No. of Serological positive holdings	Total No. of Serological positive holdings for subtype H5	Total No. of Serological positive holdings for subtype H7	Upper 95% confidence limit for Prevalence of H5 & H7
Austria	1	43	32	0	0	0	0	0	0	7.9%
Belgium	5	-	24	1	0	0	4	4	0	37.4%
Cyprus	1	2	2	0	0	0	0	0	0	77.6%
Czech Republic	1	34	34	0	0	0	0	0	0	7.2%
Denmark	1	18	18	-	-	-	0	0	0	13.2%
Estonia	-	-	-	-	-	-	-	-	-	-
Finland	1	15	15	0	0	0	0	0	0	15.7%
France	9	2856	500	9	2	1	58	55	3	14.7%
Germany*	12	15024	187	1	-	-	2	1	1	3.8%
Greece**	12	-	37	-	-	-	0	0	0	-
Hungary	20	767	268	0	0	0	0	0	0	1.0%
Ireland	2	3	3	0	0	0	0	0	0	63.2%
Italy	20	178	132	0	0	0	0	0	0	2.0%
Latvia	2	2	1	0	0	0	0	0	0	95.0%
Lithuania	1	2	1	0	0	0	0	0	0	95.0%
Luxembourg	-	-	-	-	-	-	-	-	-	-
Malta	-	-	-	-	-	-	-	-	-	-
Poland	3	325	241	0	0	0	2	2	0	3.1%
Portugal	7	14	14	0	0	0	0	0	0	16.8%
Slovak Republic	8	15	7	0	0	0	0	0	0	33.4%
Slovenia	-	-	-	-	-	-	-	-	-	-
Spain	19	119	105	1	1	0	1	1	0	5.2%
Sweden	1	37	23	0	0	0	0	0	0	11.1%
The Netherlands	1	86	63	0	0	0	0	0	0	4.6%
UK***	2	1632	88	0	0	0	1	1	0	6.2%
<b>Total</b>	<b>117</b>	<b>21172</b>	<b>1795</b>	<b>12</b>	<b>3</b>	<b>1</b>	<b>68</b>	<b>64</b>	<b>4</b>	

\* The influenza virus identified from the virologically positive holding was identified as subtype H6N1.

\*\* The total number of holdings was not reported, therefore the upper 95% limit for prevalence cannot be calculated.

\*\*\* The total number of holdings for the UK was not known: 1632 duck/geese holdings were reported from GB; the total in NI was not known.

Figure 19: Total number of Game bird holdings by Member State

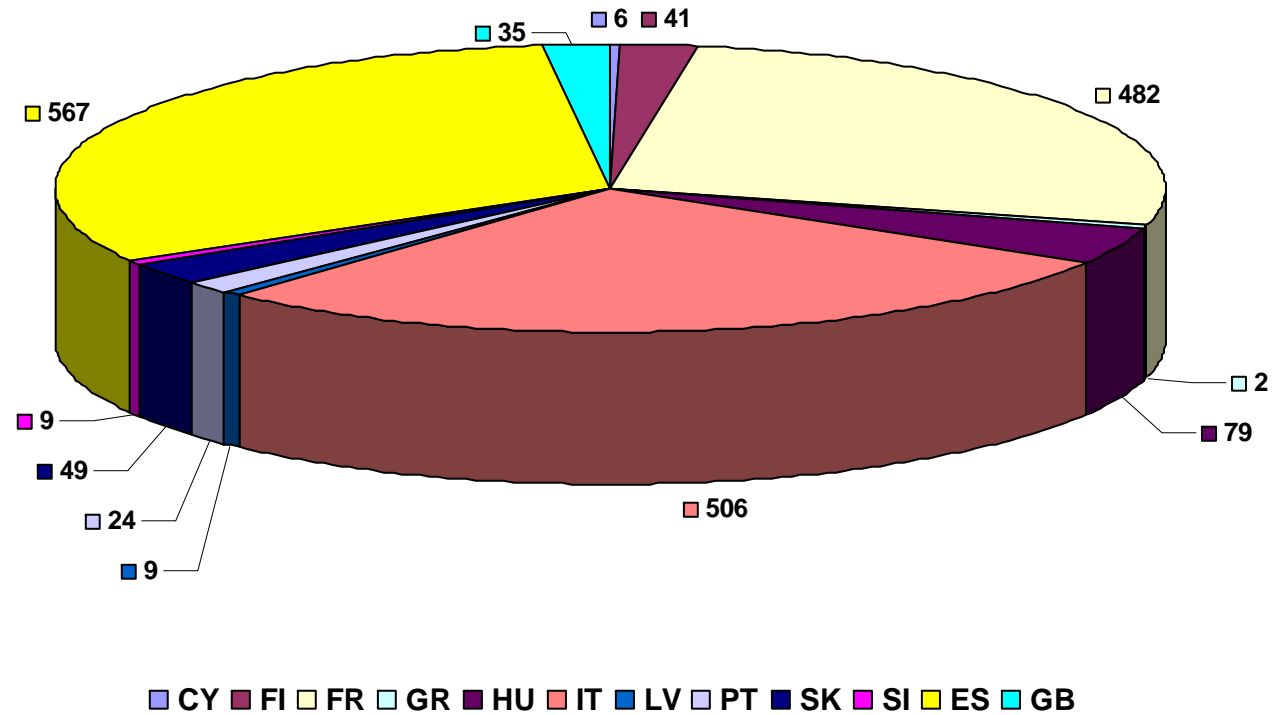
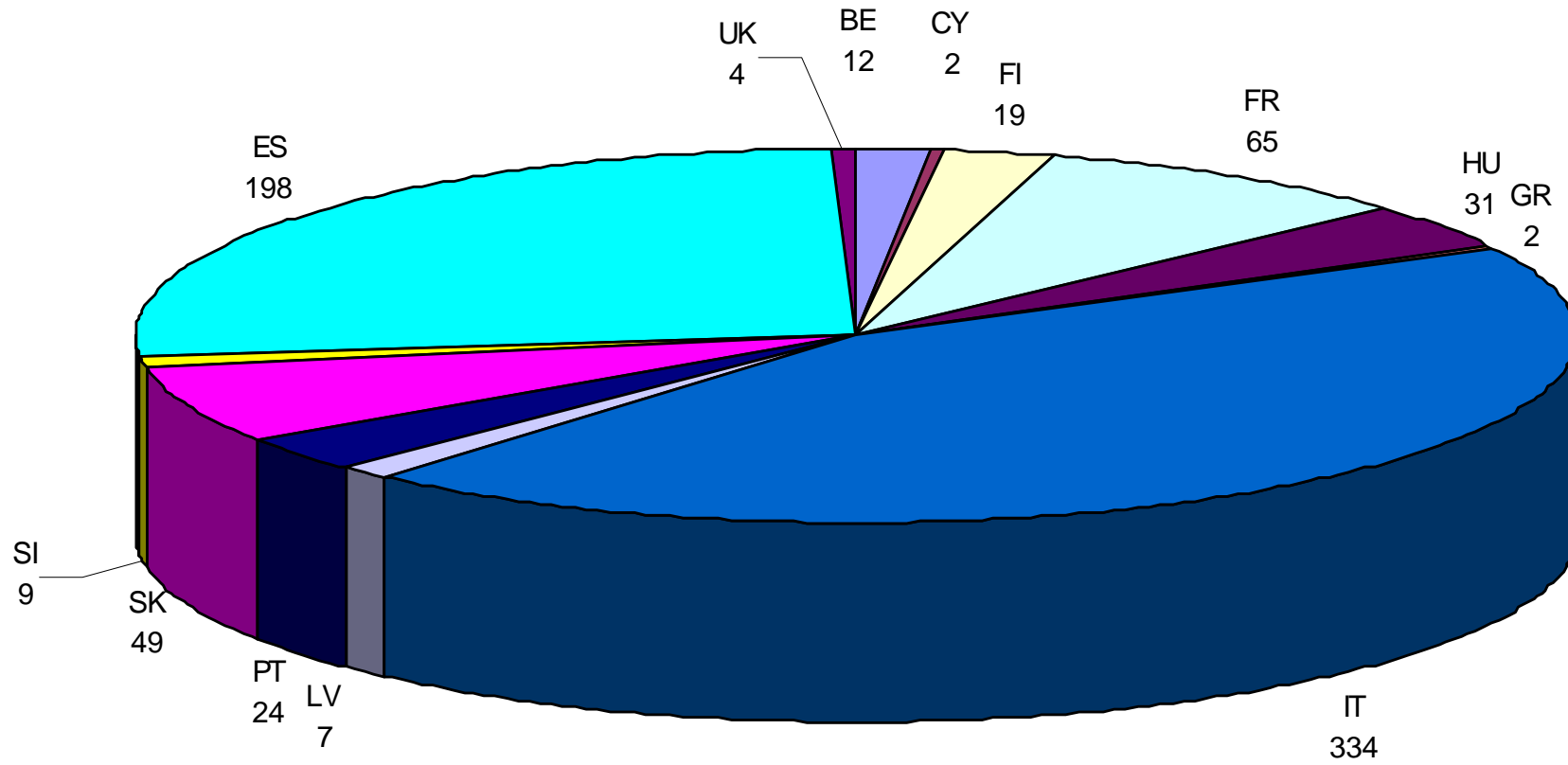


Figure 20: Total number of Game bird holdings sampled by Member State



**Table 8. Summary of Serological Survey of Avian Influenza in EU - Game Birds**

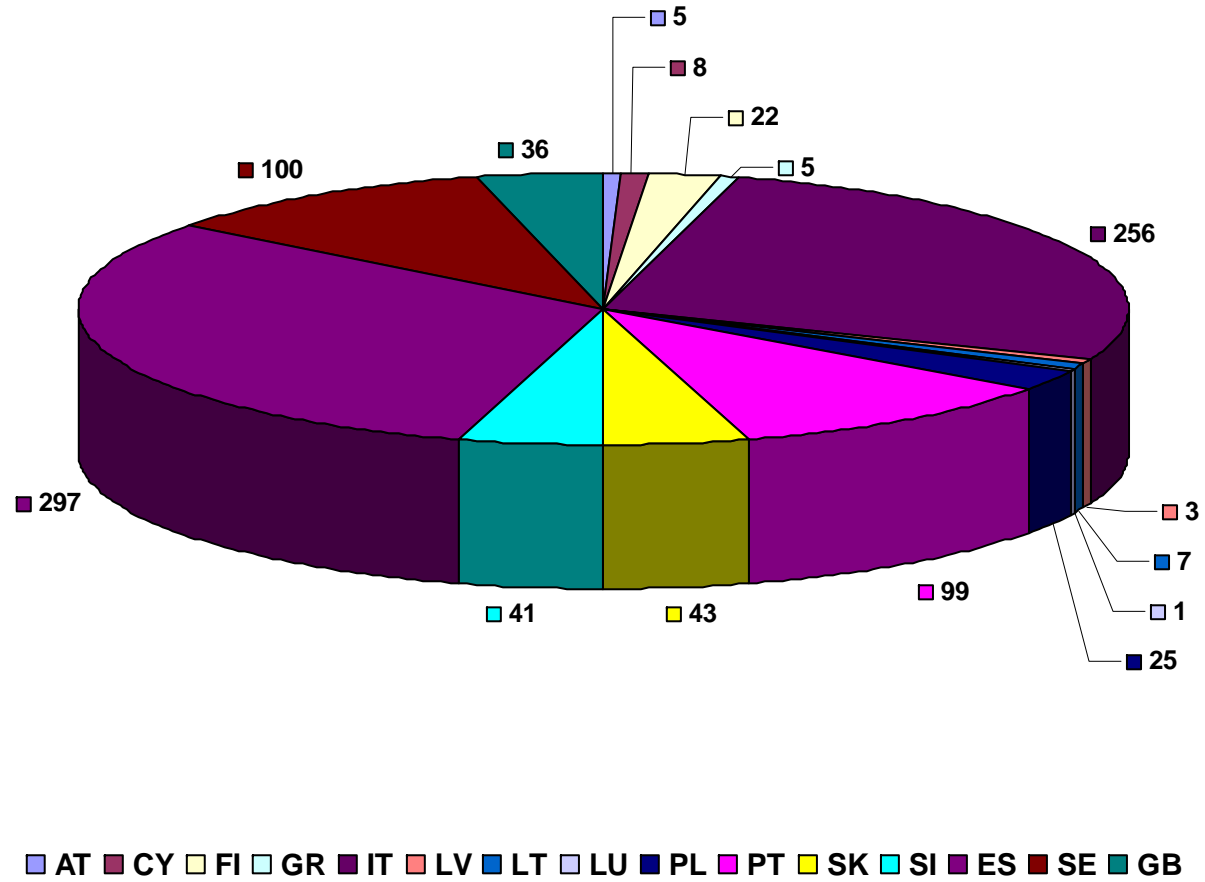
Member State	Number of Regions	Total No. of Holdings	Total No. of Holdings Sampled	Total No. Positive Holdings	No. positive holdings for subtype H5	No. positive holdings for subtype H7	Upper 95% confidence limit for Prevalence of H5 & H7
Austria	-	-	-	-	-	-	-
Belgium*	4	-	12	0	0	0	-
Cyprus	1	6	2	0	0	0	77.6%
Czech Republic	-	-	-	-	-	-	-
Denmark	-	-	-	-	-	-	-
Estonia	-	-	-	-	-	-	-
Finland	1	41	19	0	0	0	13.6%
France	8	482	65	0	0	0	4.4%
Germany	-	-	-	-	-	-	-
Greece	2	4	2	0	0	0	77.6%
Hungary**	20	79	31	0	0	0	8.7%
Ireland	-	-	-	-	-	-	-
Italy	20	506	334	0	0	0	0.8%
Latvia	6	9	7	0	0	0	32.4%
Lithuania	-	-	-	-	-	-	-
Luxembourg	-	-	-	-	-	-	-
Malta	-	-	-	-	-	-	-
Poland	-	-	-	-	-	-	-
Portugal	7	24	24	0	0	0	10.0%
Slovak Republic	8	49	49	0	0	0	5.0%
Slovenia	1	9	9	0	0	0	25.3%
Spain	15	567	198	0	0	0	1.4%
Sweden	-	-	-	-	-	-	-
The Netherlands	-	-	-	-	-	-	-
UK	1	35	4	0	0	0	52.7%
<b>Total</b>	<b>95</b>	<b>1811</b>	<b>756</b>	<b>0</b>	<b>0</b>	<b>0</b>	

\*The total number of holdings was not reported, therefore the upper 95% limit for prevalence cannot be calculated.

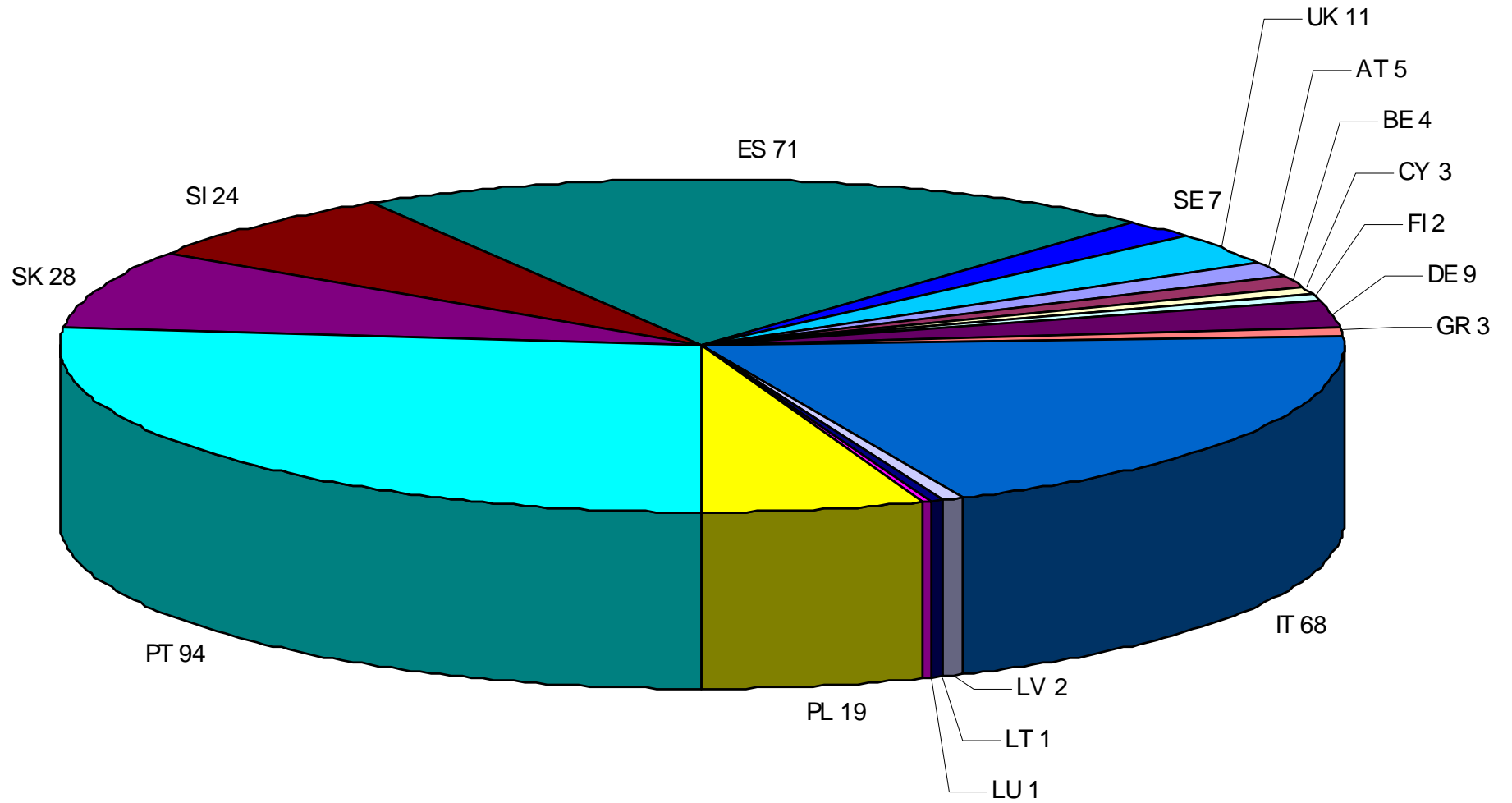
\*\* 31/79 Holdings of "other poultry" (quail, ostriches, pheasants, partridges) were sampled.



Figure 21. Total number of Ratite holdings by Member State



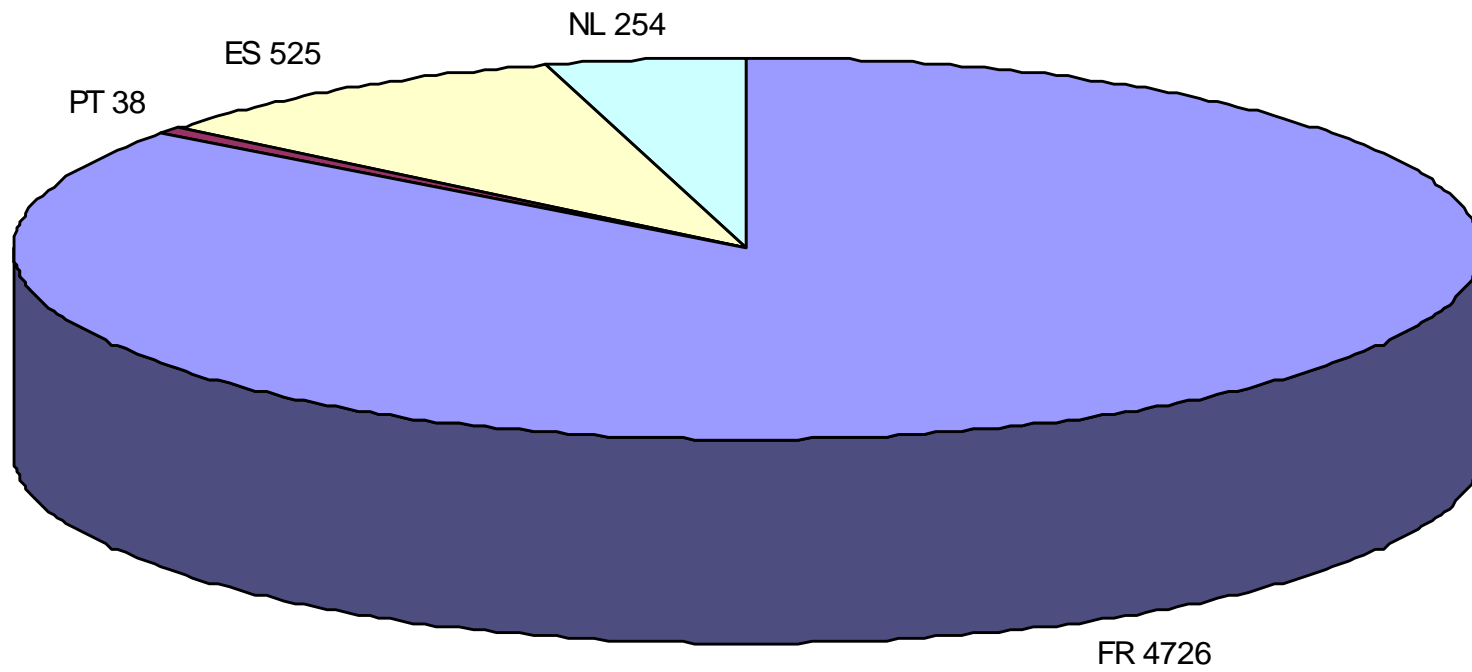
**Figure 22: Total number of Ratite holdings sampled by Member State**



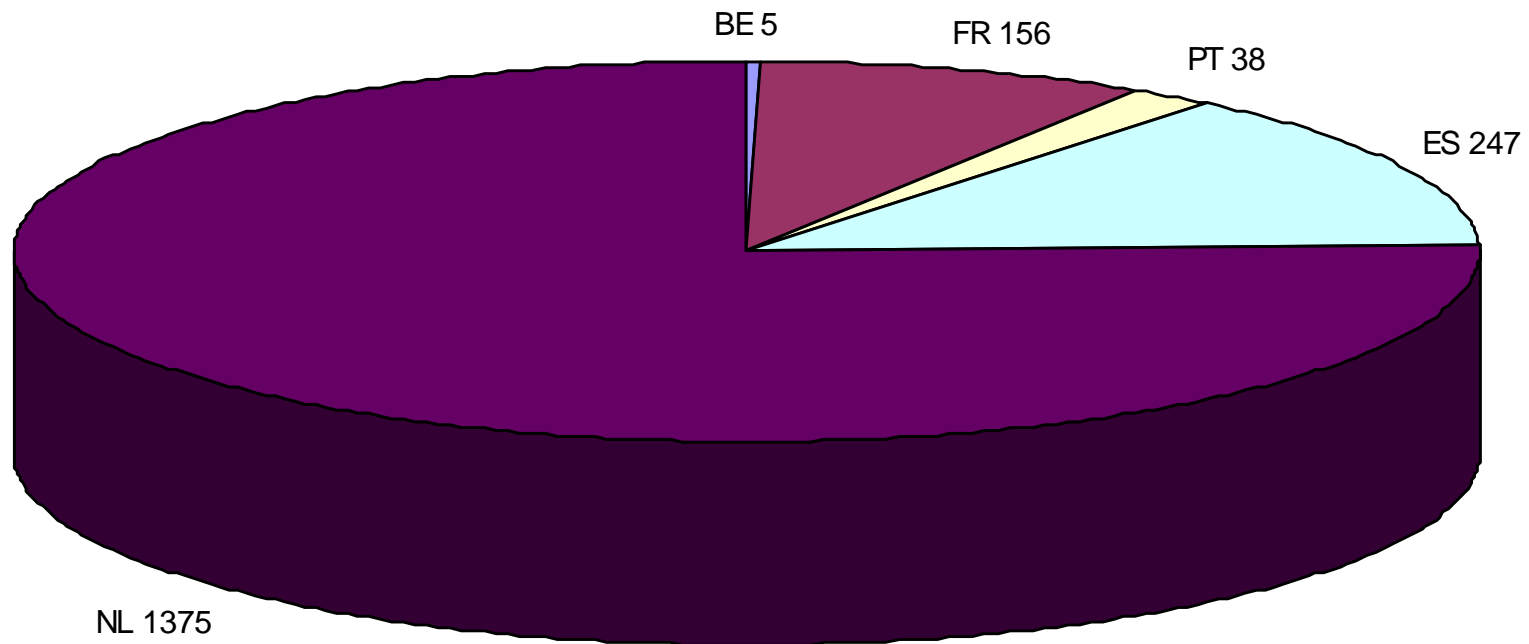
**Table 9. Summary of Serological Survey of Avian Influenza in EU - Ratites**

Member State	Number of Regions	Total No. of Holdings	Total No. of Holdings Sampled	Total No. Positive Holdings	No. positive holdings for subtype H5	No. positive holdings for subtype H7	Upper 95% confidence limit for Prevalence of H5 & H7
Austria	1	5	5	0	0	0	45.1%
Belgium	3	-	4	0	0	0	52.7%
Cyprus	1	8	3	0	0	0	63.2%
Czech Republic	-	-	-	-	-	-	-
Denmark	-	-	-	-	-	-	-
Estonia	-	-	-	-	-	-	-
Finland	1	22	2	0	0	0	77.6%
France	-	-	-	-	-	-	-
Germany	3	-	9	1	1	0	48.2%
Greece	2	5	3	0	0	0	63.2%
Hungary	-	-	-	-	-	-	-
Ireland	-	-	-	-	-	-	-
Italy	20	256	68	0	0	0	4.1%
Latvia	2	3	2	0	0	0	77.6%
Lithuania	1	7	1	0	0	0	95.0%
Luxembourg	1	1	1	0	0	0	95.0%
Malta	-	-	-	-	-	-	-
Poland	3	25	19	0	0	0	13.0%
Portugal	7	99	94	0	0	0	2.7%
Slovak Republic	8	43	28	0	0	0	9.2%
Slovenia	1	41	24	0	0	0	10.7%
Spain	14	297	71	0	0	0	4.0%
Sweden	1	100	7	0	0	0	34.6%
The Netherlands	-	-	-	-	-	-	-
UK	1	36	11	0	0	0	23.0%
Total	71	948	352	1	1	0	

**Figure 23: Total number of Other holdings by Member State**



**Figure 24: Total number of Other holdings sampled by Member State**



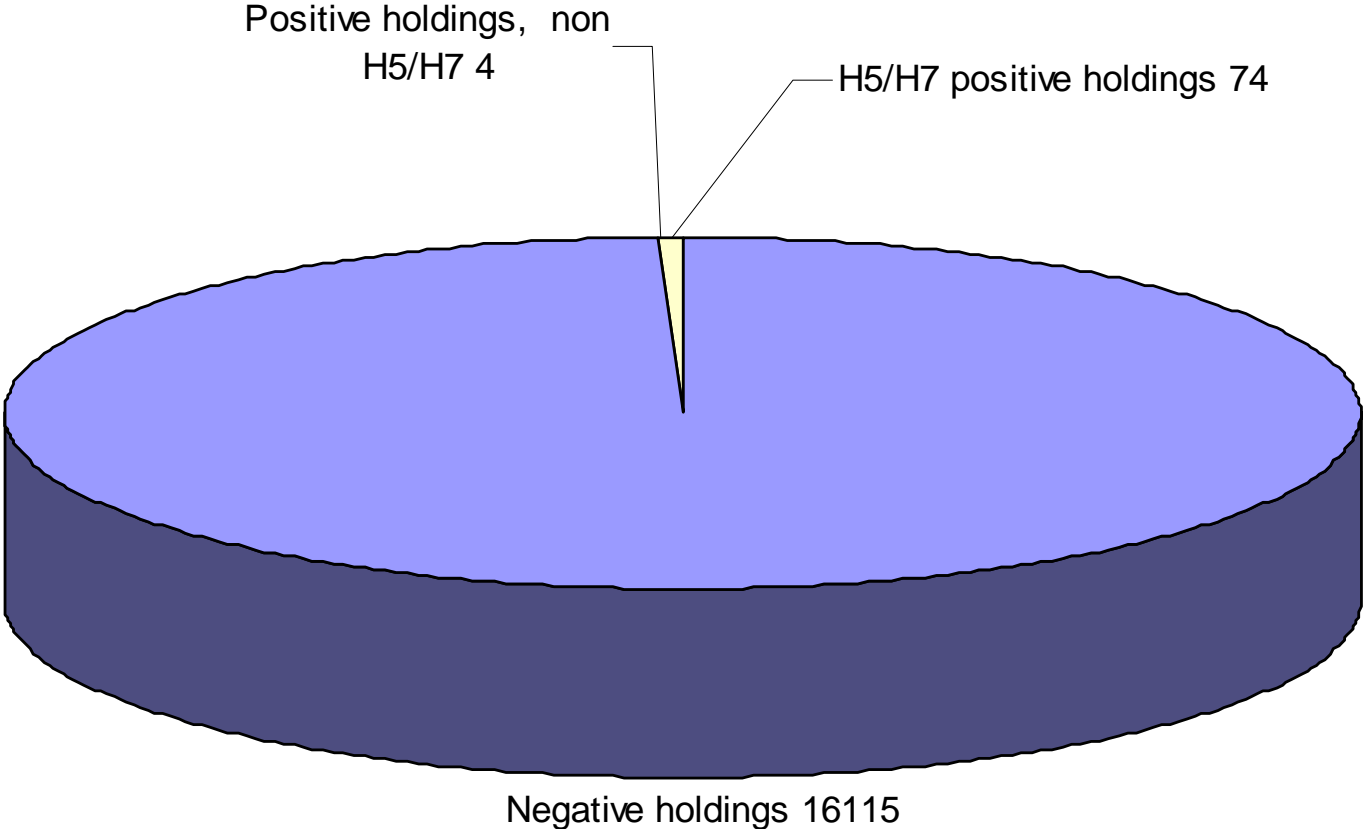
**Table 10. Summary Report of Serological Survey of Avian Influenza in EU - Others**

Member State	Number of Regions	Total No. of Holdings	Total No. of serological tested Holdings	Total No. serological positive holdings	No. serological positive holdings for subtype H5	No. serological positive holdings for subtype H7	Upper 95% confidence limit for Prevalence of H5 & H7
Austria	-	-	-	-	-	-	-
Belgium	2	NK	5	0	0	0	45.1%
Cyprus	-	-	-	-	-	-	-
Czech republic	-	-	-	-	-	-	-
Denmark	-	-	-	-	-	-	-
Estonia	-	-	-	-	-	-	-
Finland	-	-	-	-	-	-	-
France*	-	4726	156	2	1	0	3.5%
Germany	-	-	-	-	-	-	-
Greece	-	-	-	-	-	-	-
Hungary	-	-	-	-	-	-	-
Ireland	-	-	-	-	-	-	-
Italy	-	-	-	-	-	-	-
Latvia	-	-	-	-	-	-	-
Lithuania	-	-	-	-	-	-	-
Luxembourg	-	-	-	-	-	-	-
Malta	-	-	-	-	-	-	-
Poland	-	-	-	-	-	-	-
Portugal	7	38	38	0	0	0	6.4%
Slovak Republic	-	-	-	-	-	-	-
Slovenia	-	-	-	-	-	-	-
Spain	19	525	247	0	0	0	1.1%
Sweden	-	-	-	-	-	-	-
The Netherlands**	1	254	1375	0	0	0	1.2%
UK	-	-	-	-	-	-	-
<b>Total</b>	<b>29</b>	<b>5543</b>	<b>1821</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>-</b>

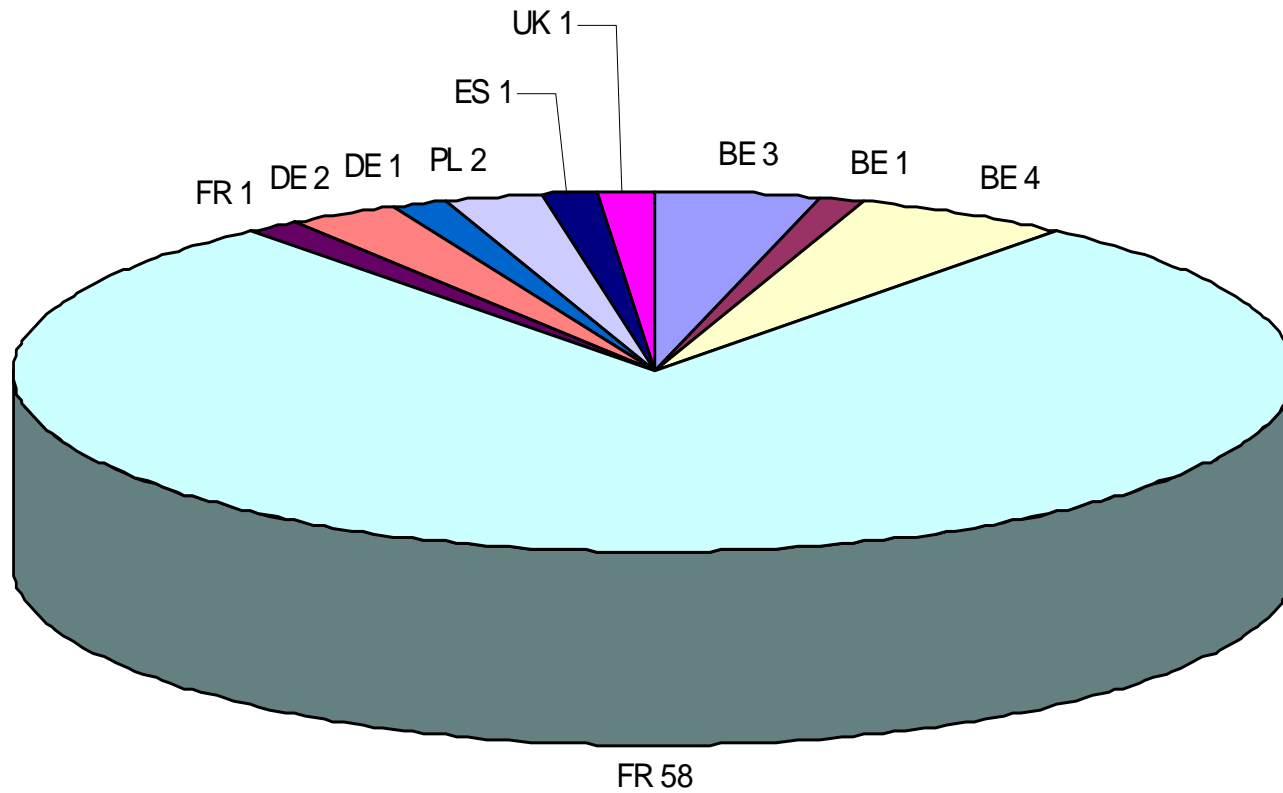
\* "Free-range chicken holdings and holdings on for "local market"", reported as Other.

\*\*Data on ready to lay pullets. Each holding was sampled at least once during the survey (every new flock is tested at these holdings), therefore the upper 95% limit for prevalence has been based 254 81 holdings.

**Figure 25: Total holdings tested positive**



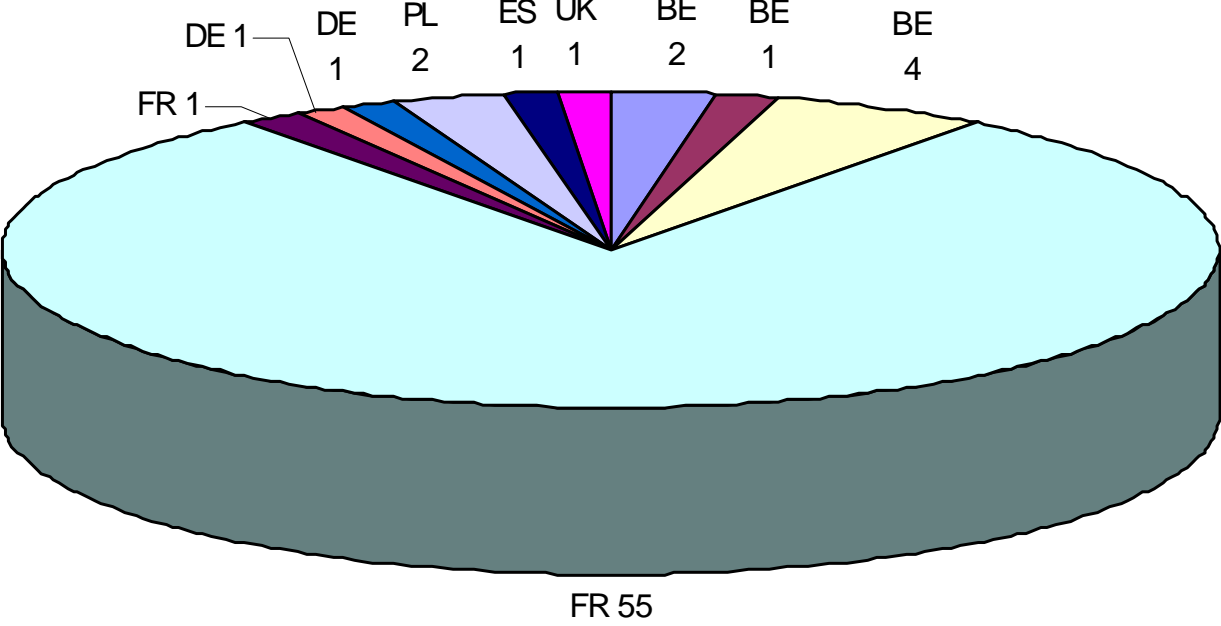
**Figure 26: Total number of serologically positive holdings (H5/H7) by Member State and Category**



- |                       |                  |                  |                  |
|-----------------------|------------------|------------------|------------------|
| ■ BE Chicken breeders | ■ BE Laying hens | ■ BE Ducks/geese | ■ FR Ducks/geese |
| ■ FR Others           | ■ DE Ducks/geese | ■ DE Ratites     | ■ PL Ducks/geese |
| ■ ES Ducks/geese      | ■ UK Ducks/geese |                  |                  |

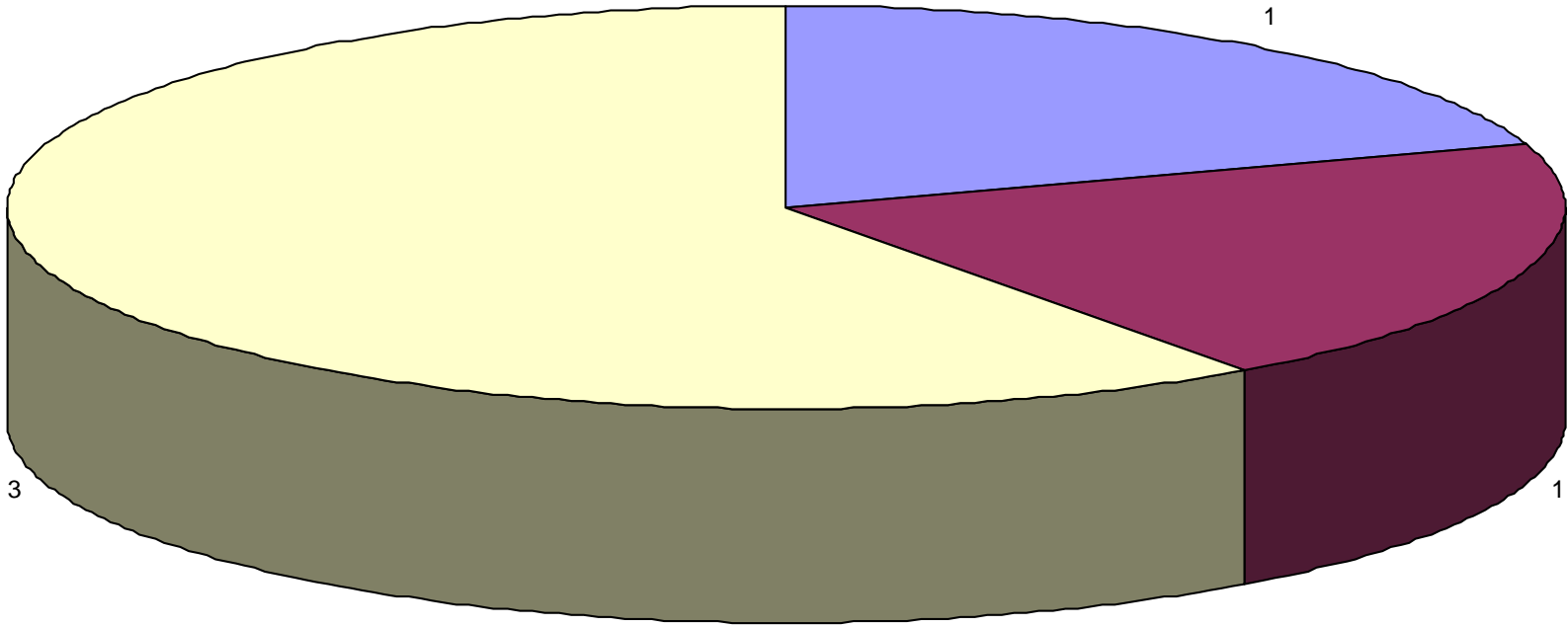


**Figure 27: Total number of H5 seropositive holdings by Member State**



- BE Chicken breeders
- FR Others
- ES Ducks/geese
- UK Ducks/geese
- BE Laying hens
- DE Ducks/geese
- BE Ducks/geese
- FR Ducks/geese
- DE Ratites
- PL Ducks/geese

Figure 28: Total number of H7 seropositive holdings by Member States

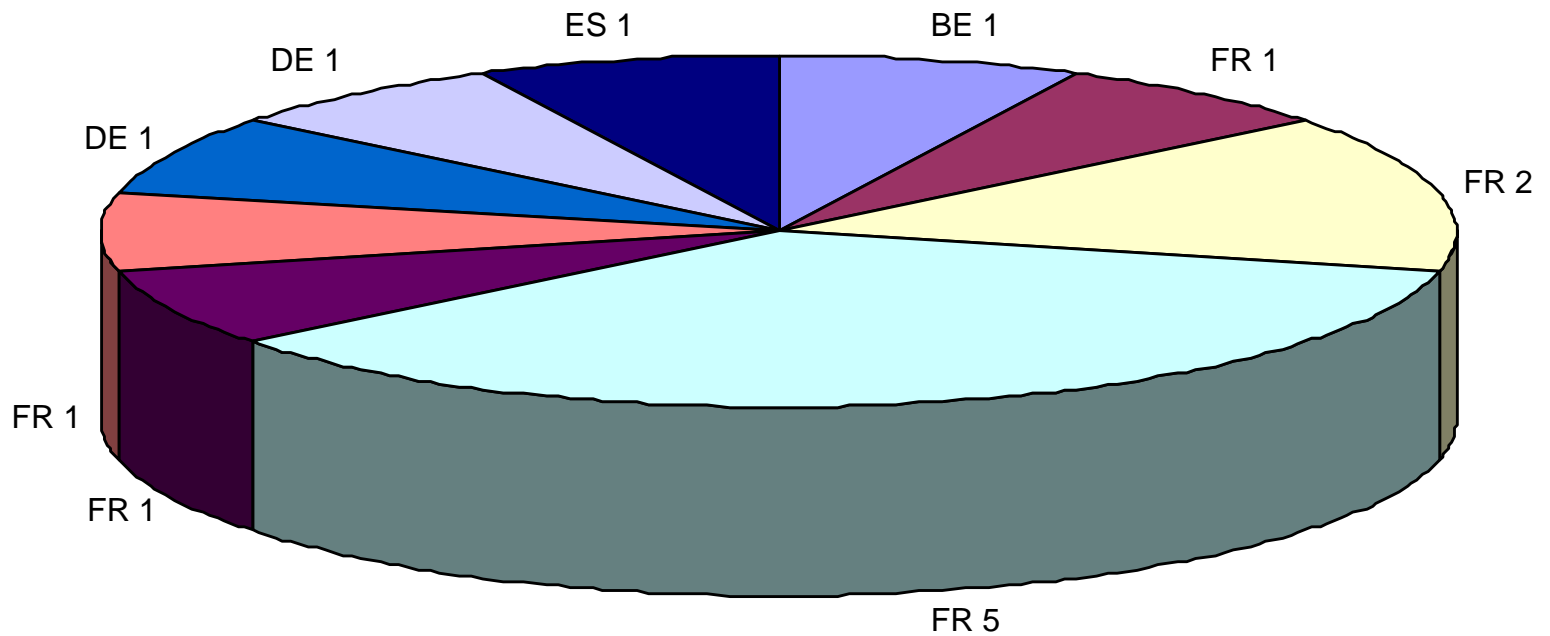


BE Chicken Breeder

DE Ducks/geese

FR Ducks/geese

**Figure 29: Total number of virologically positive holdings by Member State and Category**



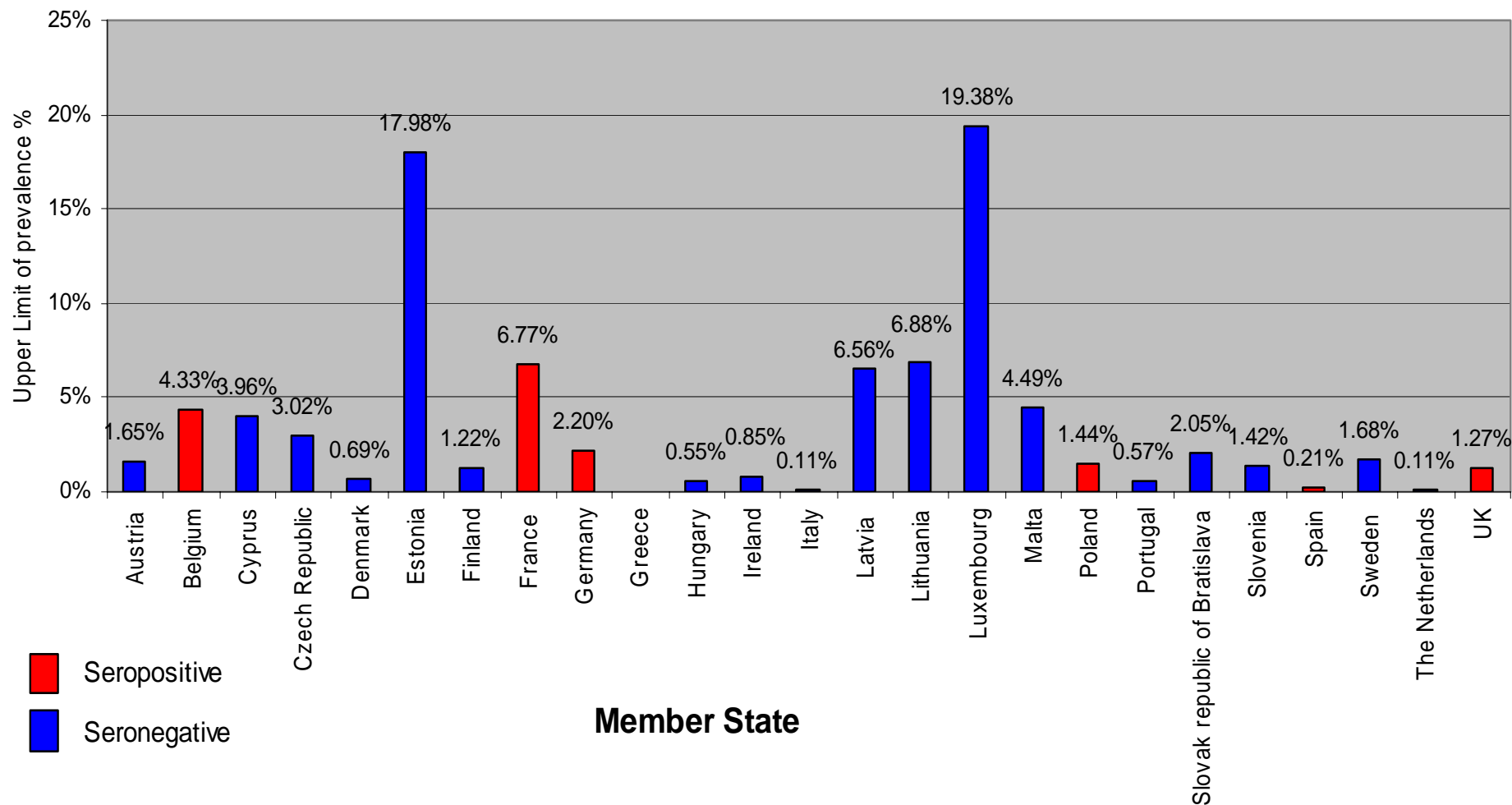
- BE Ducks/geese (H3N1)
- FR Ducks (Not H5/H7)
- DE Ducks/geese (H6N1)
- FR Others (Not H5/H7)
- FR Ducks (H7)
- DE Ratites (H5N3)
- FR Ducks (H5)
- FR Geese (not reported)
- ES Ducks/geese (H5)

**Table 11. - Total poultry holdings sampled on a national basis for avian influenza**

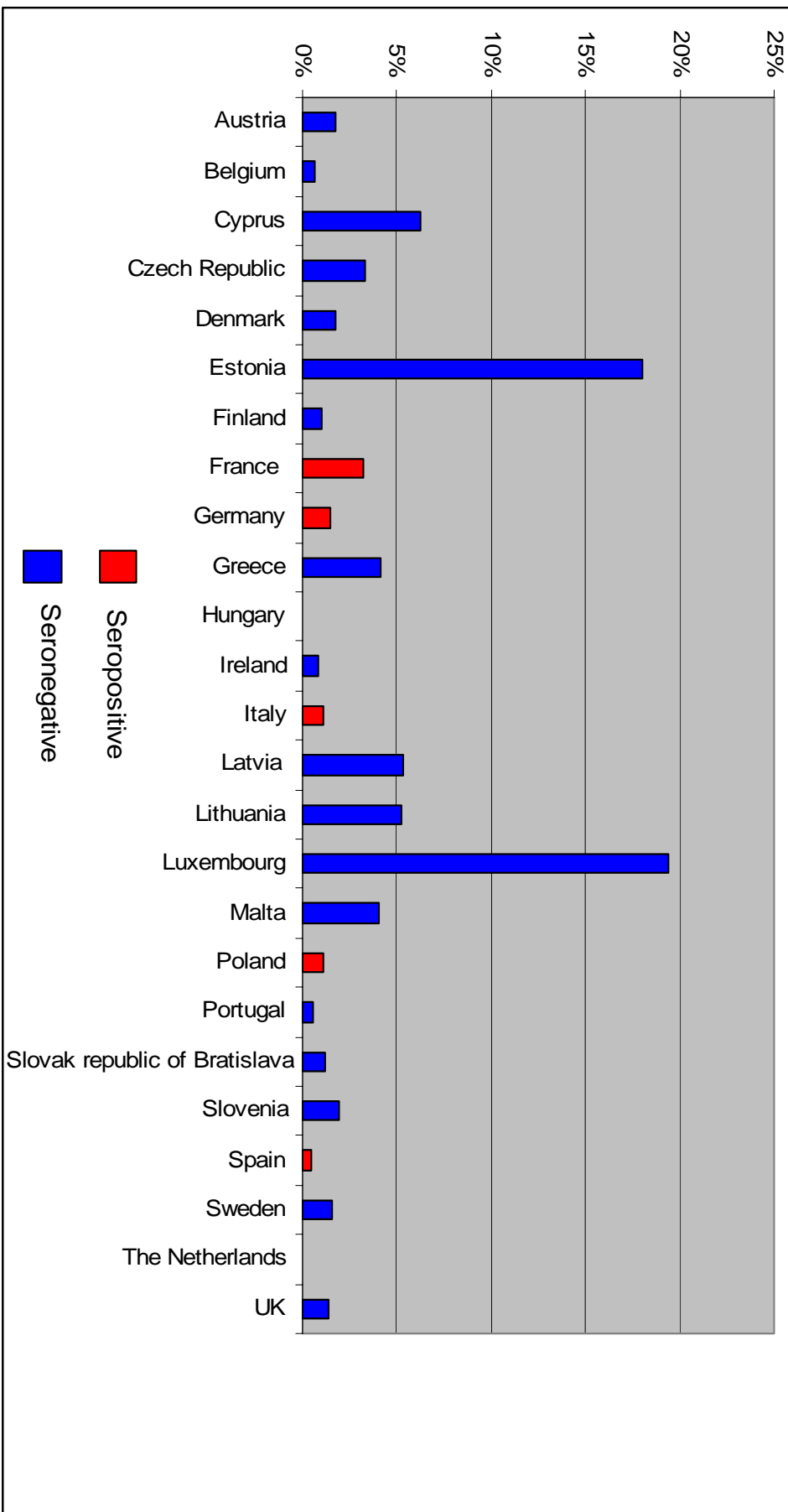
<b>Member State</b>	<b>Total holdings all categories</b>	<b>Total holdings sampled</b>	<b>Total Positive Serology</b>	<b>H5 Serology Positive</b>	<b>H7 Serology Positive</b>	<b>Virological positive</b>	<b>H5 virological positive</b>	<b>H7 virological positive</b>	<b>Upper 95% confidence interval for Prevalence</b>
Austria	1768	177	0	0	0	0	0	0	1.65%
Belgium	-	360	8	7	1	1	0	0	4.33%
Cyprus	9034	71	0	0	0	0	0	0	3.96%
Czech Republic	220	91	0	0	0	0	0	0	3.02%
Denmark	136	283	0	0	0	-	-	-	0.69%
Estonia	13	13	0	0	0	-	-	-	17.98%
Finland	1891	238	0	0	0	0	0	0	1.22%
France	12075	1115	63	56	3	10	3	1	6.77%
Germany	104884	396	3	2	1	1	0	0	2.20%
Greece*	1063	158	0	0	0	-	-	-	1.83%
Hungary	2785	527	0	0	0	0	0	0	0.55%
Ireland	398	305	0	0	0	0	0	0	0.85%
Italy	3195	2373	0	0	0	0	0	0	0.11%
Latvia	43	38	0	0	0	0	0	0	6.56%
Lithuania	174281	42	0	0	0	0	0	0	6.88%
Luxembourg	12	12	0	0	0	-	-	-	19.38%
Malta	305	63	0	0	0	-	-	-	4.49%
Poland	821	506	2	2	0	0	0	0	1.44%
Portugal	2922	526	0	0	0	0	0	0	0.57%
Slovak Republic	299	134	0	0	0	0	0	0	2.05%
Slovenia	279	187	0	0	0	-	-	-	1.42%
Spain	14112	2617	1	1	0	1	1	0	0.21%
Sweden	651	169	0	0	0	0	0	0	1.68%
The Netherlands	2672	5396	0	0	0	0	0	0	0.11%
UK	3502	438	1	1	0	0	0	0	1.27%
<b>Total</b>	<b>337361</b>	<b>16235</b>	<b>78</b>	<b>69</b>	<b>5</b>	<b>13</b>	<b>4</b>	<b>1</b>	

\* The total number of holdings for all categories excludes ducks/geese as this total was not known

**Figure 30: 2005-2006 Histogram of upper limits for prevalence in poultry of H5/H7 influenza A virus as 95% confidence level**



**Fig 31 : 2004-2005 Histogram of upper limits for prevalence in poultry of H5/H7 Influenza A virus at 95% confidence level**



## Discussion

### Main conclusions

- All categories of poultry were tested subject to regional variation and included: laying hens, broilers, chicken breeders, fattening turkeys, turkey breeders, backyard flocks, ducks, geese, farmed game birds (including quail), ratites and miscellaneous categories such as free range poultry and ready-to-lay pullets.
- In the 2005-2006 survey, 78 holdings were serologically positive for influenza A viruses. 74 holdings were identified as subtype H5 or H7 (69 and 5 respectively) the remaining 4 holdings were non H5 or H7. This compares with 66 H5 or H7 subtypes and 32 non H5 or H7 subtypes detected in the 2004-2005 survey.
- No positive holdings were reported for broilers, turkey breeders, farmed game birds and backyard flocks (only three Member States tested backyard flocks).
- No H5 or H7 positive holdings were reported for broilers, fattening turkeys, turkey breeders, farmed game birds or backyard flocks.
- Duck/geese holdings represented the largest number of positive holdings in 2005-2006 (68/78 positive holdings – based on serological results). The majority of these holdings were reported from France (58/68).
- Unlike the 2004-2005 survey no H5 or H7 positive holdings were detected this year in fattening turkeys. Three fattening turkey holdings were identified as positive for influenza A viruses in France this year but none were H5 or H7 subtypes, no positive breeder turkey holdings were detected. In 2004-2005 France and Italy both reported one H5 positive fattening turkey holding, a further 27 fattening turkey holdings were reported as positive for subtype H7 in Italy where there was an ongoing outbreak with H7N3.
- Like the findings from the 2004-2005 survey, positive holdings contained predominantly hosts known to be either more susceptible to influenza A viruses or higher risk for exposure. The upper limits for prevalence at the 95% confidence limit ranged from 0.6 to 95.0% for fattening turkeys and 1.0 to 95.0% for ducks and geese.
- In 2005-2006 six Member States; **Belgium, France, Germany, Poland, Spain** and the **UK**, reported H5 positive holdings from five different poultry categories. **All six** Member States reported H5 seropositive **duck/geese** holdings (4 holdings, 55 holdings, 2 holdings, 2 holdings, 1 holding and 1 holding respectively). One Member State, (**Belgium**), reported one H5 seropositive **laying hen** holding. One Member State, (**France**), reported one "**Chicken (free-range chicken holdings and holdings for 'local market')**" as H5 seropositive. One Member State, **Belgium**, reported 2 H5 positive **chicken breeder** holdings. One Member State, **Germany**, reported one H5 positive **ratite** holding.
- Three Member States; **Belgium, France and Germany**, reported H7 positive holdings in this year's survey. **Belgium** reported one seropositive **chicken breeder** holding. **France** reported 3 seropositive **duck/geese** holdings, and **Germany** reported 1 positive **duck/goose** holding.
- In addition to the holdings above, France reported 1 "Chicken (free-range chicken holdings and holdings for 'local market')" and 3 fattening turkey holdings as seropositive which were H5 & H7 negative.
- In total, 14 holdings from four Member States; Belgium, France, Germany and Spain, were reported as virologically positive. Belgium reported one duck & goose holding as H3N1. France reported one "Chicken (free-range chicken

holdings and holdings for 'local market')" as non-H5/H7, 2 duck holdings as H5 and a further 5 duck holdings as non-H5. Germany reported one duck & goose holding as H6N1 positive and one ratite holding as H5N3. Spain reported one duck and goose holding as H5 positive.

- In 2004-2005 five Member States, Italy, France, Germany, Spain and The Netherlands, reported H7 positive holdings.
- Overall the sampling of holdings was lower than required statistically in the programme for all but seven Member States (Czech Republic, Estonia, Italy, Luxembourg, Malta, Portugal and The Netherlands), although many were only slighter below the target number. (Germany may have sampled the required number of holdings in all categories tested, but the total number of holdings was not provided for one category).
- A summary of categories sampled by the Member States together with the number of countries reaching the required number of holdings to be sampled is given below:

Category	Number of Member States carrying out sampling of poultry category	Number reaching the statistical target
Layers	25	21
Broilers	7	3
Chicken breeders	14	10
Fattening turkeys	20	12
Breeder turkeys	10	4
		(plus 1 not known as total number of holdings was not provided)
Ducks/geese	21	13
		(plus 2 not known as total number of holdings was not provided)
Farmed game birds	12	6
Ratites	16	5
		(plus 1 not known as total number of holdings was not provided)

- The upper limits for prevalence at the 95% confidence limit across the programme ranged from 0.1% to 19% in Member States reporting H5 or H7 negative holdings and 0.2 to 6.7% in Member States reporting H5 or H7 positive holdings (figure 30). Although Estonia and Luxembourg have the highest upper 95% confidence interval for prevalence of H5 and H7 across the Member States (18% and 19% respectively), it should be noted that these intervals were based upon a small number of holdings (13 holdings and 12 holdings respectively) and the data therefore should be treated with caution.
- If all ten birds from one holding gave negative results, then the upper 95% confidence limit of the prevalence of serologically positive birds within a flock of  $\geq 1000$  birds is 26%. Thus, at a holding level, the test can only be interpreted as providing evidence of disease freedom if it is accepted that the prevalence of infection, if the virus were present, would be greater than 26%.
- In some cases, more than one batch of birds from one holding appears to have been sampled. For example, in The Netherlands holdings were sampled more



than once during the sampling period. A rigorous analysis would require that full details of the sampling scheme and full results, including the identification of repeated batches from one holding, were supplied by every Member State.

#### Future surveys

The apparent low prevalence relates to a point prevalence study and cannot offer predictive value for future status. Higher consistency in approach can be achieved by clarifying definitions as related to regions, holdings and categories of poultry. More information on the number of poultry holdings by category in a number of Member States together with appropriate sampling will be required in future surveys to fully satisfy the statistical basis of the programmes. Consistent with last years survey proposed refinements to the programme for 2005 (SANCO/10137/2005 Rev. 2) focus on improved targeting to provide the most effective use of resource and a higher degree of confidence in the results obtained by testing an increased number of duck and goose holdings compared to 2004. In addition, it is recommended that all quail holdings are tested. Furthermore, it is recommended that broilers are omitted from future programmes since they are less useful populations for early detection owing to short life span and general rearing conditions. Finally it is important that result quality is enhanced by use of standard antigens in the serological survey. Therefore it is important that all national reference laboratories acquire their antigens for this purpose from the CRL (as provided for in the work programme of the CRL).