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Self-declaration of recovery of freedom from avian influenza in poultry by Hungary

Declaration sent to the OIE on 24 August 2017 by Dr Lajos Bognár, OIE Delegate for Hungary, Ministry of Agriculture

Avian influenza situation

On 26 October 2016, the National Reference Laboratory (NRL) for avian influenza of Hungary detected the presence of highly pathogenic avian influenza virus (HPAI) (H5N8 subtype) in a mute swan found dead in the south-east part of the country. This case was also the first detection of the HPAI of the 2016-2017 European epizootic.

A week later, increased mortality, drop of feed/water intake and weakness was observed in a turkey holding (keeping 9000 birds) in Békés County, and H5N8 HPAI was confirmed by the NRL on 3 November 2016.

240 outbreaks of HPAI H5N8 strain occurred in poultry in Hungary from 3 November 2016, when the first case in poultry occurred, to 21 April 2017 (Table 1 and 2). The outbreaks occurred in the following counties: Bács-Kiskun, Békés, Csongrád, Győr-Moson-Sopron, Hajdú-Bihar, Jász-Nagykun-Szolnok, Somogy, Veszprém. Over 2.6 million heads of poultry have been killed in response to these outbreaks.

Most of the outbreaks took place in Bács-Kiskun county, which is the most densely populated county as regards to poultry. Here, six additional outbreaks occurred after that all restrictive measures had been lifted, at the end of March. However, these outbreaks were situated in a previously non-affected area. The final cleaning and disinfection of the last affected holding in Hungary took place on 24 May 2017.

Besides domestic poultry, HPAI has been detected in ten captive wild birds (in five different locations) and in over 200 wild birds (62 outbreaks in 50 localities, 16 counties, one of them was due to H5N5).

Table 1. Number of affected holdings and birds by species

Species	Number of holdings	Number of birds
ducks	128	176 900
geese	54	199 000
ducks and geese	4	74 500
turkey	6	65 500
Gallus gallus; of which	5	508000
laying hen	4	440 000
broilers	1	68 000
backyard (mixed species: Gallus gallus, ducks, geese, turkey)	41	7 900
pheasant	2	11 800
Total	240	1 043 600

Table 2. Number of outbreaks by county

County	Number of outbreaks
Bács-Kiskun	184
Csongrád	29
Békés	13
Jász-Nagykun-Szolnok	9
Hajdú-Bihar	2
Győr-Moson-Sopron	1
Veszprém	1
Somogy	1
Total	240

Fig 1. Location of HPAI outbreaks in poultry, Hungary, 2016 - 2017

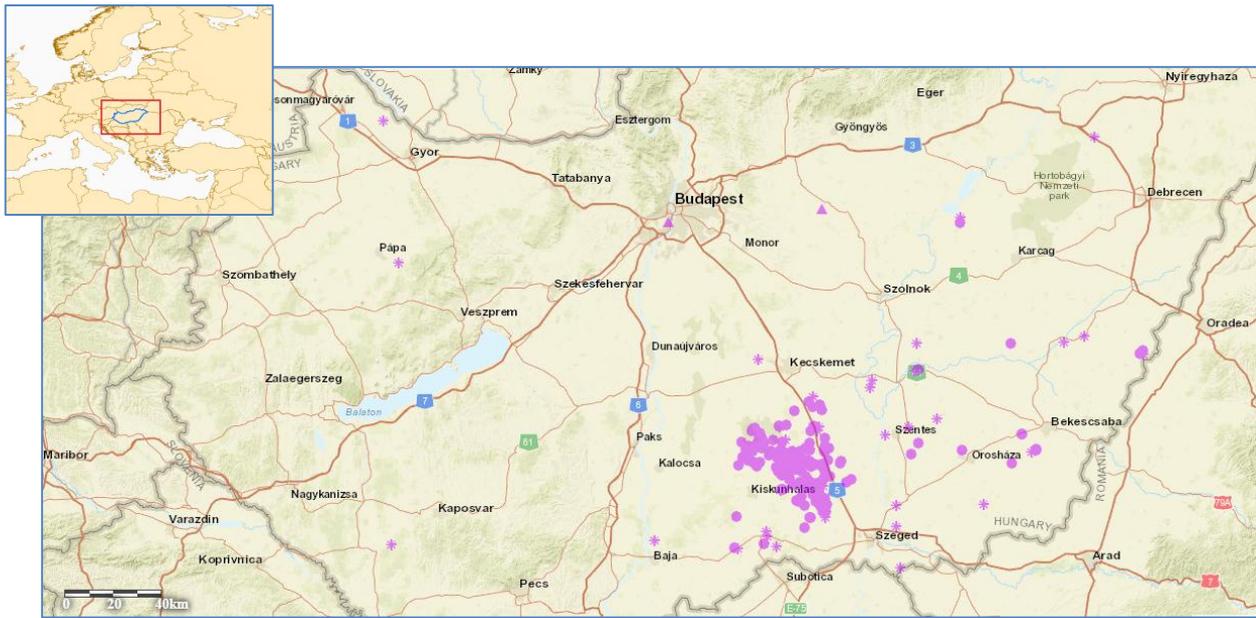
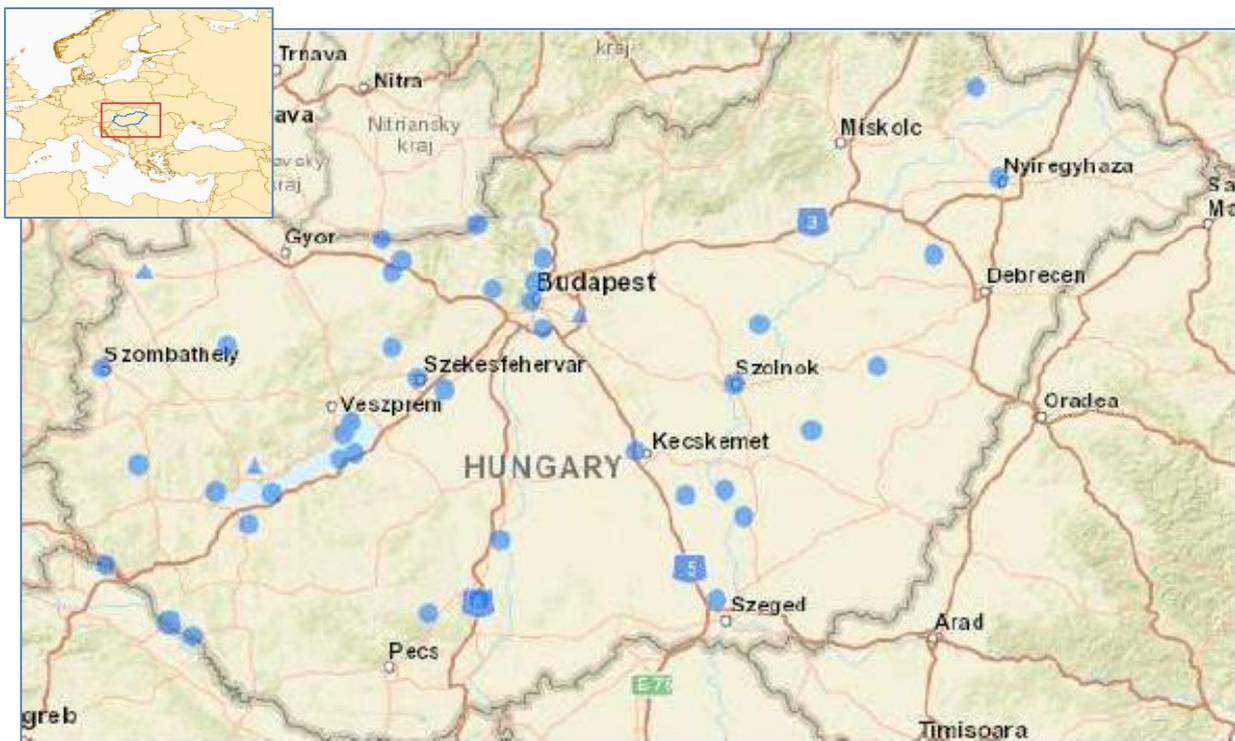


Fig 2. Location of HPAI outbreaks in wild birds and captive wild birds, Hungary, 2016-2017.



Surveillance and early detection system

Avian influenza is a notifiable disease in Hungary. Animal keepers, veterinarians and anybody handling animals (e.g. transporters) should notify any illness or death of their animals to the veterinary authority. This obligation is detailed in Act No. XLIV of 2008 on Food chain and its official supervision. A list of suspect signs is laid down in Decree No. 143/2007 of the 'Minister of Agriculture and Rural Development' on the detailed rules on protection against avian influenza. These signs include: more than 20% of loss in water intake and food consumption; egg drop of at least 5% for more than 2 days; more than 3% morbidity for one week and any clinical or pathological signs that can be associated to avian influenza. Notifications are motivated by the 100% state compensation paid for the dead and killed animals.

Active surveillance in poultry (large and small scale) and passive surveillance in wild birds have been going on since 2005 (table 3).

The Hungarian Avian Influenza surveillance programme is based on representative sampling, therefore all counties' authorities (19) take part in the sampling.

The number of poultry holdings to be sampled corresponds to those in Tables 1 and 2 of Annex I of European Commission Decision 2010/367/EC of 25 June 2010¹. Each county is involved in sampling, and the number of samples depends on the number and category of its poultry holdings. The number of samples is set out and controlled by the Animal Health and Animal Welfare Directorate of the National Food Chain Safety Office.

Local authorities should determine which holding will be sampled. Elements such as the location of the holding and its proximity to wetlands should be considered.

Sampling is carried out by veterinarians. Blood samples are collected from poultry for serological investigations according to the number fixed by the Central Authority for each county. Each concerned holding is sampled once throughout the year in case of negative results. Diagnostic method is haemagglutination-inhibition test (HAG) to detect H5 and H7 (Chapter 2.3.4. of the OIE - *Manual of Diagnostic Tests and Vaccines for Terrestrial Animals*). Most of the samples are taken at the end of the year. None of the samples taken in the framework of active surveillance has been positive. (See table 3.)

Table 3. Routine active surveillance* of poultry, Hungary, 1 January 2016 – 25 May 2017 (before, during and after epidemic)

Period	Holdings	Samples
1 January 2016 – 31 October 2016	748	11699
1 November 2016 – 24 May 2017	433	7948
25 May 2017 – 31 July 2017	33	461

* According to Commission Decision 2010/367/EC

The surveillance programme for avian influenza in wild birds (table 4) is implemented in the whole country, considering that almost in every county there are either wetlands, lakes, rivers or backwaters as typical habitats for migratory wild birds, in particular water birds, as target species. Passive surveillance is in force, moribund or dead birds are collected for virological examination. Every year the sample size is reviewed on the basis of previous years' activities and the target population is set

¹ European Commission Decision 2010/367/EC of 25 June 2010:
<http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32010D0367&from=FR>

out by each county veterinary authorities according to European Commission Decision 2010/367/EC of 25 June 2010.

Passive surveillance is targeted on birds belonging to “higher risk” species listed in Annex II of Decision 2010/367/EC, other wild birds living in close proximity to these species and also on wild birds at risk of coming in close contact with domestic poultry holdings. Veterinarians or hunters are responsible for the implementation of the sampling. Bird watchers, ornithologists, hunters or anyone who discovers a dead or moribund bird shall deliver it to the competent authority, *i.e.* the competent veterinarians. Oropharyngeal/tracheal or cloacal swab samples, tissues or corpses are sent by the competent authority immediately to the National Reference Laboratory (NRL) for virological examination. Since 2015, due to increasing risk, the veterinary authority in cooperation with “BirdLife Hungary” (the leading non-profit, apolitical, and charitable, nature conservation organisation in Hungary) has carried out an active monitoring programme of wild birds (oropharyngeal/tracheal or cloacal swab samples taken from live wild birds, mainly the ones which are caught for ringing, the target species are basically the same as for passive surveillance). The diagnostic method is PCR (Chapter 2.3.4. of the OIE - *Manual of Diagnostic Tests and Vaccines for Terrestrial Animals*)².

Table 4. Active and passive surveillance of wild birds*, Hungary, 1 January 2016 – 31 July 2017 (before, during and after epidemic)

Period	Samples	Positive	Negative
1 January 2016 – 31 October 2016	368	1	367
1 November 2016 – 24 May 2017	714	165	547
25 May 2017 – 31 January 2017	60	0	60

* according to European Commission Decision 2010/367/EC.

Surveillance after the occurrence of the outbreaks

Surveillance in the affected holdings and in restriction zones has been carried out in accordance with Commission Decision 2006/437/EC³ approving a Diagnostic Manual for avian influenza as provided for in Council Directive 2005/94/EC⁴. For passive surveillance, dead birds from suspected farms were collected. For active surveillance, samples were oropharyngeal/tracheal or cloacal swabs from live birds before transport from restricted zones to the slaughterhouse or further keeping.

Further to the above mentioned measures, the Chief Veterinary Officer ordered to take additional samples (swabs) in the free part of the affected counties and districts (in Bács-Kiskun, Békés and Csongrád county and in Kunszentmárton district of Jász-Nagykun-Szolnok county) from animals which were sent to slaughter, or moved to another place. Transport could only take place after tests resulted negative.

The diagnostic method used was rt-PCR (Chapter 2.3.4. of the OIE - *Manual of Diagnostic Tests and Vaccines for Terrestrial Animals* 2.03.04).

Table 5. Active surveillance in poultry due to the outbreaks*, Hungary, 1 November 2016 – 31 July 2017

² http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.03.04_AI.pdf

³ Commission Decision 2006/437/EC:

<http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32006D0437&from=EN>

⁴ Council Directive 2005/94/EC:

<http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32005L0094&from=en>

Period	Samples	Positive samples	Negative samples
1 November 2016 – 31 December 2016	909	10	899
1 January 2017 – 24 May 2017	1755	0	1755
25 May 2017 – 31 July 2017	117	0	117

*according to Commission Decision 2006/437/EC

Table 6. Results of the diagnostic tests conducted following clinical surveillance in poultry*, Hungary, 2016 – 31 July 2017

Year	Samples	Positive samples	Negative samples
1 November 2016 -31 December 2016	978	313	665
1 January 2017 – 24 May 2017	723	26	697
25 May 2017 – 31 July 2017	128	0	0

*according to Commission Decision 2006/437/EC

Approximately 5% of the outbreaks were detected on the basis of samples taken before direct transport to slaughter. This and the fact that 10% of the outbreaks were detected during preventive killing (see later) means that Hungary was able to detect the outbreaks before the symptoms turned up.

Epidemiological investigations

No animals were moved from the affected holdings to other countries during the 21 days before the development of clinical symptoms. Hatchings eggs were transported during that period to other countries, they were notified immediately after the detection of the outbreaks and the eggs were traced back.

The results of epidemiological investigations showed that the primary source of infection was wild birds. There were several outbreaks, where indirect contact with migratory wild birds is assumed, on the basis of the presence of numerous wild birds resting on surface water in the area, or bird droppings found at holdings after wild birds flew over them.

Spread between holdings (most probably by infected animals, wind, vehicles and also people) happened as well. Some characteristics of the waterfowl production system facilitated this type of spread, such as the high human labour needed and the typical family-run small holdings with lower level of biosecurity.

Control and eradication measures

Control and eradication activities were carried out by the veterinary authority.

Procedures and measures implemented during outbreaks were based on Council Directive 2005/94/EC on Community measures for the control of avian influenza and repealing Directive 92/40/EEC.

This Directive is implemented in Hungary by Decree no. 143/2007 of the Minister of Agriculture and Rural Development where the rules on protection against avian influenza are detailed.

Strict measures were ordered, which included: killing of all birds at the affected holdings and safe disposal of carcasses and all contaminated material; cleaning and disinfection; establishment of restriction areas of at least 3 and 10 km radius, where general movement restriction is in place. Movement of poultry could only take place with the permission of the veterinary authority and when applying additional biosecurity measures (e.g. for direct slaughter). Where the epidemiological situation requested it, the surveillance zones were enlarged further than 10 km in certain cases to cover areas, at highest density of poultry population. In the restriction zones, poultry holdings were visited and sampled (all holdings in the protection zone and the ones with epidemiological links or suspicion in the surveillance zone).

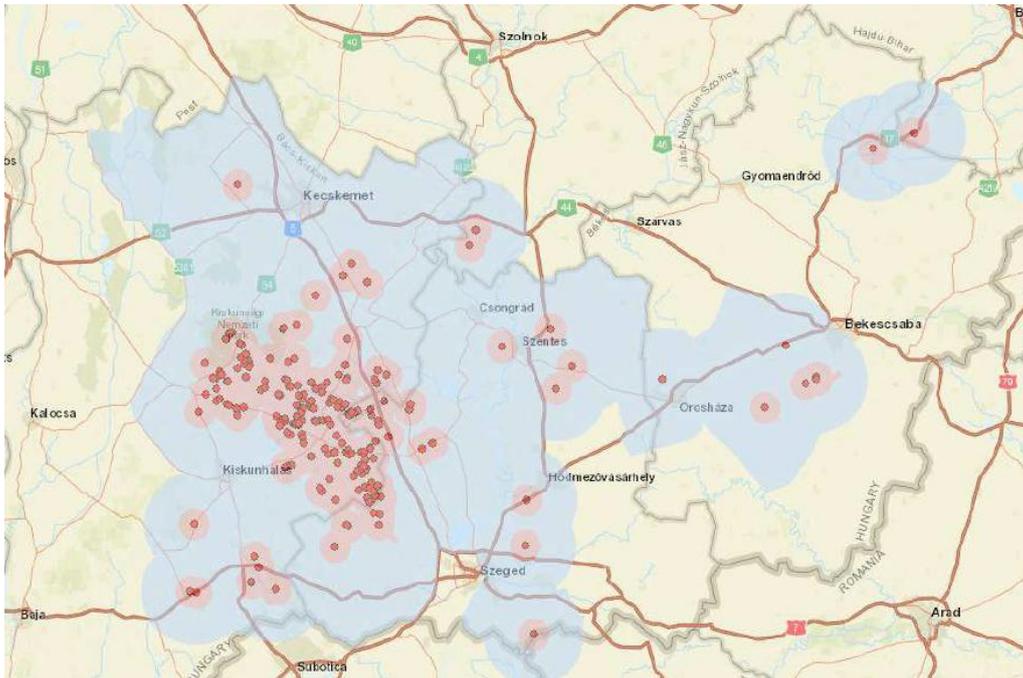
Poultry in the affected holdings were killed in accordance with the rules of the European Union in line with Chapter 7.6. of the *Terrestrial Animal Health Code (Terrestrial Code)*. Carcasses were destroyed at rendering plants.

Beside the 2.6 million poultry killed at the affected holdings, another 450 000 birds were killed in the framework of preventive measures and another 375 000 were killed because their planned transport to the restricted territory could not take place. Altogether more than 3.4 million poultry were killed in connection with the epidemic.

Stamping out has been performed in the area at highest density, within 1 km zones of the outbreaks as a preventive measure. This affected approximately 0.6 million poultry in Bács-Kiskun country, out of which approximately 150 000 were kept in flocks which turned out to be infected on the basis of samples which were taken during culling (10% of the outbreaks).

The re-population of commercial poultry holdings could take place after 21 days following the date of completion of the final cleansing and disinfection. Disinfectants were purchased centrally, and the procedure itself was supervised by official veterinarians in order to ensure that the disinfectants were used in required amount and concentration. Due to the weather conditions (winter conditions) disinfections could not be carried out immediately, thus lifting of restrictive measures had to be postponed in many cases. After repopulation, clinical and laboratory examinations were carried out and the holdings were put under official surveillance for another 21 days.

Fig. 3 Outbreaks and restriction zones of the three most affected counties (Bács-Kiskun, Csongrád and Békés), at the peak of the epizootic (first half of January 2017).



National Avian Influenza Reference Laboratory

The Directorate for Veterinary Diagnostics of the National Food Chain Safety Office is the national avian influenza reference laboratory (NRL) of Hungary, on the basis of Point 2 - Article 51 of 2005/94/EC Council Directive on Community measures for the control of avian influenza and repealing Directive 92/40/EEC. The NRL is accredited since 2005 through the Hungarian accreditation body and it operates and is assessed in accordance with European standards. The laboratory personnel consists of highly trained and skilled experts with experiences and pasts of relevant work done in influenza virus research and molecular diagnostics. Starting from the first outbreak, more than 175 000 swab samples and more than 7 500 dead birds were analysed by real time RT-PCR methods recommended by the EU/OIE Avian Influenza reference laboratory. In the first step a screening with an M gene AIV RT-PCR was performed and differential RT-PCR was used to determine the type of virus for the positive samples. In order to confirm the type and pathogenicity of the virus more than 1 200 PCR products were sequenced. Furthermore complete genome of 60 H5N8 and one H5N5 highly pathogenic avian influenza virus were sequenced by Next Generation Sequencing for epidemiologic and genetic studies. Sequences were submitted to the Global Initiative on Sharing All Influenza Data (GISAID) databases (<http://platform.gisaid.org>).

The big majority of the samples were swabs (94%) and 4% of samples were organs processed prior by the pathology department. Approximately half of the samples were sent to check the health status of birds prior to transport for slaughter, the other half consisted of samples sent for screening purposes and samples originating from wild birds, suspicions or samples taken by veterinary authorities during epidemiological investigations.

The number of samples investigated per day by RT-PCR was between 2 000 and 3 000, on average. The maximum number of samples per day was 4 000 with a final documented PCR result on the same day. In addition, urgent samples were received frequently, where a final PCR result including the type of virus was provided in 4-6 hours. Specific service was introduced to transport the samples every day to the NRL from the countryside.

The diagnostic work and the exceptional results were highly appreciated and acknowledged by the EU Community Veterinary Emergency Team.

Table 7. Number of tests carried out during the epidemic

Test method	Number of tests
PCR	39 184
HAG	12 356
Virus isolation	818

Additional measures ordered by the Chief Veterinary Officer:

As additional measures, the Chief Veterinary Officer ordered to pen the birds in during feeding and watering in order to avoid contact with wild birds for the whole country (4 November). Later all poultry of the affected countries had to be penned in (from 15 November) and then in the whole area of Hungary (27 January). Strict rules on biosecurity measures with specific emphasis on restocking were also ordered (16 February) and are still in place.

Conclusions

Bearing in mind that

- Prior to the occurrence of outbreaks in November 2016, Hungary had been free from highly pathogenic avian influenza in poultry;
- Stamping out measures were adopted that included cleaning up and disinfecting all the affected farms;
- Three months have elapsed as stipulated in Point 1 of Article 10.4.3. of the OIE *Terrestrial Code* since the end of clean-up and disinfection operations;
- Surveillance has been performed in accordance with Articles 10.4.27. to 10.4.33. of the OIE *Terrestrial Animal Health Code* during the three-month period.

The OIE Delegate of Hungary declares that the country has met the requirements to gain a country status as free from infection with avian influenza viruses in poultry as of 24th August 2017, in accordance with Article 10.4.3. of the *Terrestrial Animal Health Code*.