



An Roinn Talmhaíochta,
Bia agus Mara
Department of Agriculture,
Food and the Marine

H6N1 Epizootic in Ireland in 2020

AI ND EURL meeting
23-24th Sept. 2020

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Index case

- 20th of February 2020 clinical signs noticed
- 49 weeks, Layer flock barn unit
- Located on the Rep. of Ireland and Northern Ireland border
- Less than 1km from a known LPAI H6N1 positive flock in Northern Ireland



Clinical signs_Index case



- Egg drop - initially 34% reduction to 96% reduction over 6 days.
- Abnormal eggs - soft, misshapen, thin-shelled.
- Small increase in mortality (0.01% increased to 0.03% over 8 days)
- Decreased feed and water intake.

Farm investigation/sampling_Index case



- **At the farm:**
 - 20 oropharyngeal swabs
 - 20 cloacal swabs
 - 20 bloods
 - 5 bird carcasses
- **Post-mortem:**
 - Intestinal tissue
 - Lung tissue
 - Brain tissuefrom each bird

Test results_Index case



- Tissues and swabs:

- Positive for AI MP PCR, H6, and N1 PCR
- Negative for H5, H7 PCR

- Blood serum:

- Positive for AI AGID and AI ELISA
- Negative for AI H5 and AI H7 HAI

- Virus inoculation in SPF Embryonated Eggs:

- Embryo egg death began at 72h post-virus inoculation (< 24-48h for HPAI, \geq 48h for LPAI).

- Virus isolation and Sequencing of HA protein \rightarrow consistent with H6 Northern Ireland strain.

Subsequent outbreaks

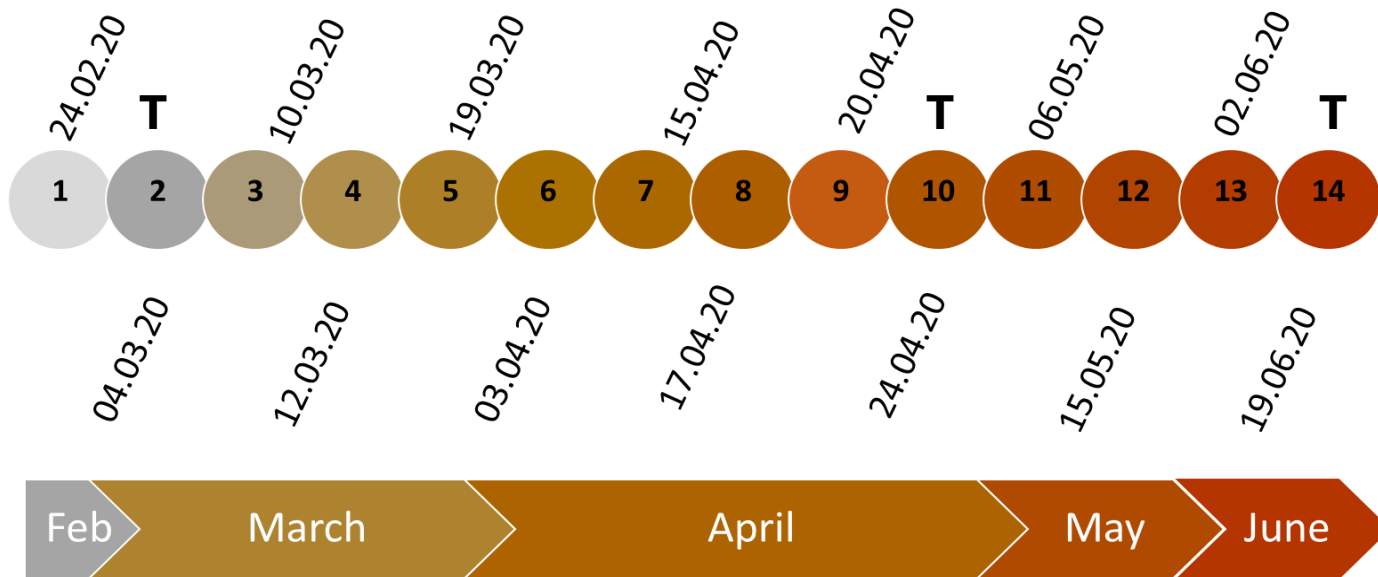


- 2nd outbreak in commercial Turkey
 - At 22km North East of 1st case.
 - Not obvious epidemiological link to the first outbreak.
- Low mortalities, slight lethargy
- 3 more outbreaks were identified in enriched caged layers
- 7 more outbreaks in layers with outdoor access (free range and organic)
- 2 more outbreaks in commercial turkey farms
- Total of 14 flocks



All in County Monaghan

Time-line of confirmed cases



T=turkeys

LPAI H6N1 was confirmed in the 14 commercial poultry flocks in County Monaghan between 24/02/2020 and 19/06/2020. Majority of cases occurred in March and April.

In addition 5 more flocks were suspect of H6N1 however ruled out after testing.

General clinical signs



Layers:

- Egg drop –ranging from significant (<48 hr) to gradually (e.g. 7 days)
- Abnormal eggs - soft, misshapen, thin-shelled
- Watery diarrhoea +/- green colouration
- Small increase in mortality (<2%)
- Decreased feed and/or water in take
- Dullness, depression

Turkeys:

- Lethargy
- Slight mortalities

Sampling/testing protocol



Sample type	Samples collected	AI MP PCR	H5 PCR	H7 PCR	H6 PCR	N1 PCR	AI ELISA	AI AGID	VI
Oropharyngeal swabs VTM	N=20* pools 4,5	x	x	x	x	x			x
Cloacal swabs VTM	N=20 *pools 4,5	x	x	x	x	x			x
Brain tissue VTM	N=5	x	x	x	x	x			x
Lung tissue VTM	N=5	x	x	x	x	x			x
Intestine tissue VTM	N=5	x	x	x	x	x			x
Blood heart serum	N=20						x	x	

Overall results (1)



Laboratory tests:

- Oropharyngeal/cloacal swabs, intestine and lung tissue tested positive for AI MP, H6N1 PCR
 - High viral load in intestine tissue in Layers
 - High viral load in lung tissue in Turkeys
 - Low viral load/none in brain tissue in all cases.
- Samples tested all negative for H5, and H7 PCR
- Serum tested positive for AI ELISA and AI AGID

Overall results (2)



Post-mortem examination* :

- Layers: No or partially formed eggs in oviduct in some cases. Egg peritonitis identified in one case. Oviducts empty, active follicles, suppurative peritonitis in a few hens.
- Turkeys: marked pulmonary congestion and oedema in visceral sampled birds.

**Notes provided by Pathology Division*

- **Based on laboratory tests and PM examination: Indication of virus having high tropism for intestine and reproductive system in Layers whereas high tropism for lungs in Turkeys**

Overall results (3)



- **Sequencing:**

Sequencing of virus fragments (HA -haemagglutinin-protein) and preliminary phylogenetic analysis showed more than 99% similarity to one of the strains in the Northern Ireland outbreak.

- 1631 base pair

- *Further phylogenetic analyses on the later outbreaks are underway by collaborators:*

- OIE/FAO Reference Laboratory for AI/ND, APHA (UK)

- OIE/FAO/European Reference Laboratory for AI/ND, IZSVe (Italy).

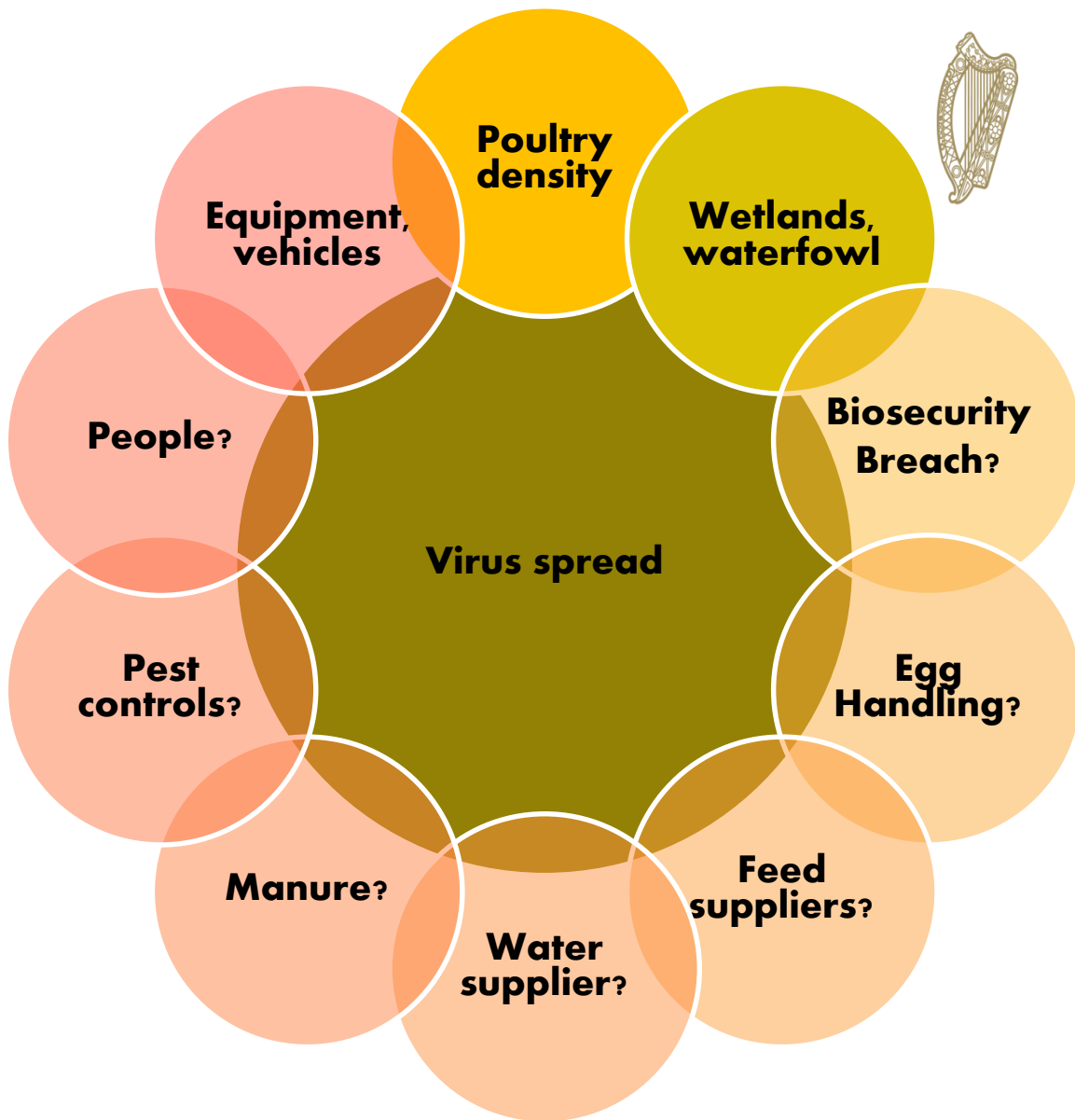
Actions (1)



- All 14 holdings were treated as HPAI/LPAI H5 or H7 suspect until ruled out.
- All 14 were derestricted under the Avian Influenza Legislation (H6N1 not notifiable).
- Therefore, no legal requirement to cull affected flocks.
- Nevertheless, industry / flock owners voluntarily depopulated affected flocks.

Actions (2)

- A full epidemiological investigation is ongoing which aims to elucidate some of the ways of infection spread.
- Co. Monaghan has the highest density of poultry industry. More than half of commercial poultry population localised in this area.



Surveillance from Jan-Jun 2020



- National Poultry Health Programme –AI AGID: 5297 samples. Mainly broilers, broilers breeders in this period.
- H5/H7 HAI EU surveillance: 2012 samples in broilers, breeders, layers and turkeys
- Passive Wild bird surveillance- AI PCR: 58 birds
- All tested negative

Acknowledgments



- Flock owners cooperation
- Private Veterinary Practitioners
- Dept. of Agriculture, Food and the Marine
- OIE/FAO Reference Laboratory for AI/ND, APHA (UK)
- OIE/FAO/European Reference Laboratory for AI/ND, IZSVe (Italy)
- Northern Ireland Authorities