

EPIDEMIOLOGY REPORT ON AVIAN INFLUENZA IN A QUARANTINE PREMISES IN ESSEX

INTRODUCTION

1. The following provides a report on the epidemiology of AI infection in a quarantine premises following the isolation a highly pathogenic avian influenza virus.

THE INITIAL ISOLATION OF AN HPAI VIRUS

2. The virological examination of tissues from two birds that had died in a quarantine premises in Essex, in south-east England, revealed an H5 avian influenza (AI) virus which was characterised as a highly pathogenic (HP) strain on 21 October 2005.

THE QUARANTINE PREMISES AND THE CONSIGNMENTS OF IMPORTED BIRDS

3. The last batch of quarantined birds at these premises were legally released on 9 March 2005, some six months before the first consignment of birds of current interest entered the premises (see below).

4. The quarantine premises are owned by a company which own a total of four premises. There had been no contact, direct or indirect, with other quarantine premises containing imported birds.

5. At the time of the confirmation of an H5 HPAI virus, the remnants of two consignments of birds were present. The first consignment comprised birds from Surinam imported on 16 September 2005. The second consignment comprised mixed species of birds from Taiwan imported on 27 September 2005 which arrived at the quarantine premises on 28 September. The details of these two consignments are given in Tables 1a and 1b. In addition, four sentinel chickens were kept in the facility, as required by the quarantine conditions. These birds were also culled on 21 October.

Species	Imported	Deaths in quarantine not examined		No. killed on 21 October 2005	No. In freezer (f) or fridge (r)
		Date of reported incineration	No.		
Black Headed Caique <i>Pionites melanicephala</i>	36 (incl. 2 dead on arrival)	17/09/05	2	0	0
		23/09/05	16		
		04/10/05	9		
		07/10/05	7		
		Sub-total	34		
Blue Headed Pionus <i>Pionus Menstruus</i>	18	07/10/05	6	9	2 (f)
Red Shoulder Macaw <i>Ara nobilis</i>	5	N/A	0	76	0
Yellow Headed Amazon <i>Amazona ochrocephala</i>	8	N/A	0		
Orange Wing Amazon <i>Amazona amazonica</i>	64	N/A	0		1 (r)
Blue & Gold Macaw <i>Ara ararauna</i>	12	N/A	0	12	0
Green winged macaw <i>Ara chloroptera</i>	5 (incl. 1 dead on arrival)	N/A		4	0
TOTAL	148		40	101	3

Number of birds imported from Surinam, by species, on 16 September 2005, the number of fatalities reported to have been incinerated, the number of carcasses stored in the freezer and 'fridge and the number of birds culled on 21 October 2005.

Table 1a

Species	Imported	Deaths in quarantine not examined		No. killed on 21/22 October 2005	No. In freezer (f) or fridge (r)
		Date of reported incineration	No		
Mynah	65	N/A	0	65	0
Mesia	101* (incl. 4 dead on arrival)	07/10/05	10	48	31 (f) 7 (r)
Black Throat Laughing Thrush	20	N/A	0	20	0
Total	186		10	133	38

* One more than recorded on the formal paperwork

Number of birds imported from Taiwan, by species, on 27 September 2005, the number of fatalities reported to have been incinerated, the number of carcasses stored in the freezer and 'fridge and the number of birds culled on 21/22 October 2005.

Table 1b

Note: the Blue Headed Pionus, from South America, and a Mesia, from Taiwan from which the pooled sample was taken are not included in tables 1a and 1b.

MORTALITY AND LABORATORY EXAMINATIONS BEFORE THE DETECTION OF HPAI

6. In the consignment that arrived from Surinam on 16 September there were three birds dead on arrival (1 Green Winged Macaw and 2 Black Headed Caique) and within the first four days two more birds (Black Headed Caique) died. Two of these birds (1 Green Winged Macaw and 1 Black Headed Caique) were submitted to the Veterinary Laboratories Agency (VLA), Weybridge on 20 September with negative results for avian influenza and Newcastle Disease.

7. In the consignment that arrived from Taiwan at the Border Inspection Post (Heathrow Airport) on 27 September and the quarantine facility on 28 September there were 4 mesias dead on arrival. These birds were not subject to laboratory examination.

8. As indicated in Tables 1a and 1b there were a number of dead birds that were reported as incinerated. The precise dates of the deaths are unknown for these birds. In addition, carcasses of 33 dead birds were stored in a freezer, of which 2 were Blue Headed parrots and 31 were Mesias and carcasses of 7 Mesias and 1 Orange Winged Parrot were stored in the refrigerator (see below). The keeper believes that these birds died before 7 October.

9. Mortality in the Black Headed Caique population was notably high (100%), but this was not attributed to any particular reason/aetiology. This is because laboratory examinations are primarily directed at providing evidence of

infection with Newcastle Disease Virus and Avian Influenza Virus. From the laboratory investigations conducted there was no evidence that this species was infected when they arrived at the quarantine premises.

10. The Mesias, from Taiwan, also exhibited a notable mortality. This was attributed to nutritional/dietary problems by the keepers. The only clinical sign, observed by keepers, apart from the deaths, was moulting.

11. The disposition of the birds within the quarantine premises is depicted in Figure 1. The timeline of events up to the time of the identification of H5 infection is depicted in Figure 2.

RESULTS OF LABORATORY EXAMINATIONS

12. The initial isolation of a highly pathogenic strain of an H5 AI virus was made from pooled tissues from a Blue Headed Pionus, from South America, and a Mesia, from Taiwan, that were found dead on 14 October. The audit trail on these laboratory submissions is not straightforward, but the balance of evidence is that these two species were sampled for virology in the pool of tissues formed from the carcasses submitted for laboratory examination.

13. Subsequent laboratory examinations revealed that the isolate was H5N1 and not a strain that the Avian Virology Unit at VLA Weybridge have isolated previously. The strain most closely resembles an isolate from wild ducks in China earlier in 2005.

14. Serological examinations of the four **sentinel chickens** sampled on 20 October were negative. These birds were healthy when they were humanely killed on 21 October. Serology, on samples taken on 21 October, was also negative. Cloacal samples, taken at the same time, were negative using conventional (embryonated eggs) virological methods. In addition, a pool of intestinal tissues taken from these four birds *post mortem* were negative on virus isolation.

15. Cloacal/faeces samples from the **parrot** (*spp* and origin not known) and **budgerigar owned by the keeper** in the house adjoining the quarantine facility were **negative** on conventional virus isolation.

16. Conventional virus isolation from five pools of viscera from the **30 Mesia** corpses stored in the freezer (one corpse was too autolysed for virus isolation) has revealed three **positive** isolations. The other two pools were negative. The three isolates of an avian influenza virus from these birds have been typed as HP **H5N1**.

17. Virus isolation has proved **positive** from the two pools of tissue from the 7 Mesias stored in the 'fridge. Molecular genetic characterisation of this isolate has identified it as an HP **H5N1**.

18. The samples from the two **Surinamese Blue Headed Pionus** (which were in the **freezer** with the 31 Mesias) were **negative** on virus isolation, after second passage in eggs.

19. Virus isolation has proved **negative** on the samples from the **Mynahs** and **Laughing Thrushes** (imported from **Taiwan**).

20. Virus isolation has proved **negative** on the samples from the **macaws and parrots from Surinam**, which included the sick **Orange Winged Amazon**, in cages/area C (please see Figure 1).

21. Virus isolation has proved **negative** on the samples from the **Mesias** in sectors C and D (see Figure 1) that were humanely put down on 21 October.

22. Virus isolation has proved **negative** on the samples from the **parrots and macaws** in cages/area D (see Figure 1).

23. It should be noted that not all of the carcasses of birds killed or present on the premises on the 21 October were submitted for virological examination. In line with accepted epidemiological sampling practice carcasses were grouped according to species and location in the quarantine facility, representative samples were taken from each group and pooled for virological examination.

EPIDEMIOLOGICAL SUMMARY

From the results of virological examinations we can conclude:

- The parrot and budgerigar kept as pets by the keeper at the adjoining premises were not infected with an AI virus.
- No isolates of avian influenza virus were made from the birds imported from Surinam or the sentinel chickens other than the initial pooled sample, which included a mesia.
- Within the species imported from Taiwan the virus (H5N1) was only detected in the Mesias.
- H5N1 virus was only isolated from a proportion of the stored dead birds. Autolysis may have precluded virus isolation from some of these birds.
- No virus was isolated from the healthy Mesias that were humanely put down on 21 October. This suggests that mortality in this species was associated with H5N1 infection, but it is uncertain whether it was the only cause of death
- H5N1 infection was, on the balance of probabilities, introduced into the facility by the Mesias
- Infection with H5N1 was transmitting between the Mesias, but from the evidence of the virological examinations it had not transmitted to the other species in the facility.
- The molecular genetic characterization isolate of H5N1 examined so far has indicated that it is most closely associated with an isolate from Chinese ducks.

- The mortality in the Surinamese Caiques does not appear to be associated with H5N1 infection – the bird that was dead on arrival was virus negative.

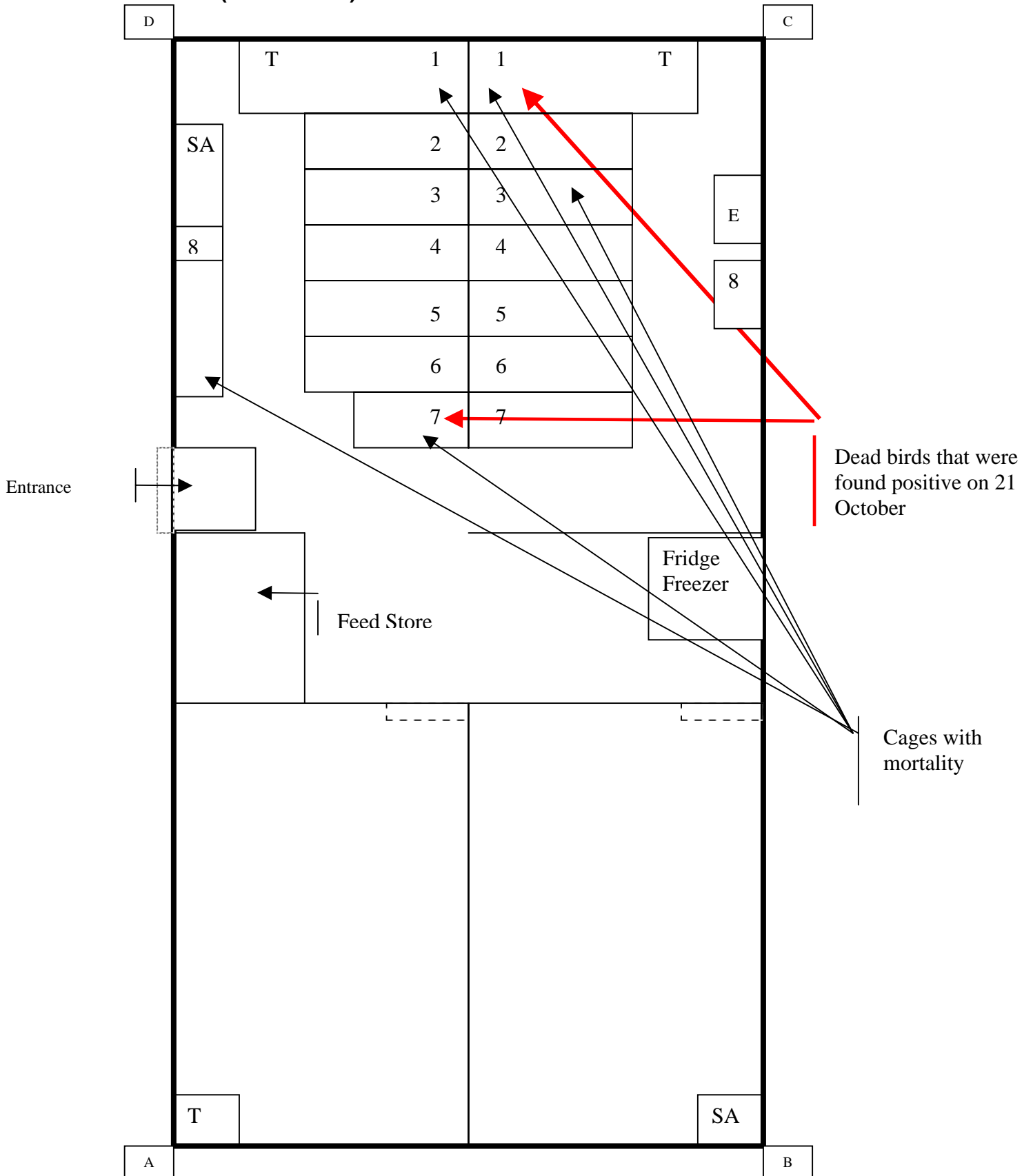
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National Emergency Epidemiology Group
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Figure 1.
Plan of the Quarantine unit premises

(not to scale) with information on the location of the birds



Key to Figure 1: List of cages and birds housed in them at the quarantine facility according to information provided by the keeper on 23/10/05.

Cage	Species	Origin
A	Mynahs	T
	Black Throat Laughing thrush	T
B	Green wing macaw	SA
	Blue & Gold Macaw	SA
C1	Mesia	T
C2	Orange Wing and Yellow headed Amazons	SA
C3	Orange Wing and Yellow headed Amazons	SA
C4	Blue Headed Pionus	SA
C5	Orange Wing and Yellow headed Amazons	SA
C6	Orange Wing and Yellow headed Amazons	SA
C7	Orange Wing and Yellow headed Amazons	SA
C8	Orange Wing Amazon (Sick)	SA
D1	Mesias	T
D2	Orange Wing and Yellow headed Amazons	SA
D3	Orange Wing and Yellow headed Amazons	SA
D4	Orange Wing and Yellow headed Amazons	SA
D5	Orange Wing and Yellow headed Amazons	SA
D6	Red shoulder Macaw	SA
D7	Blue Headed Pionus	SA
D8	Caiques	SA
E	Sentinel fowl	local

A to D: the room of the unit, T, SA: origin of birds Taiwan & South America respectively

