

Avian Influenza Detection in Incoming Chickens and the Environment of Poultry Collecting Facilities (PCFs) in DKI Jakarta

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Introduction

Avian Influenza (AI) is still a serious threat for poultry and humans. In Indonesia there have been 163 human cases with 135 fatalities (Case Fatality Rate 82.82%) until April 2010 (WHO 2010). One important place for AI disease transmission, particularly in DKI Jakarta, is poultry collecting facilities (PCFs). A previous study in 2008 found 84.2% of PCFs in DKI Jakarta positive for H5 AI viruses (Basri et al., 2008). This study continues on the previous study and aims to detect AI viruses in the PCF environment and poultry coming to PCFs, measure the frequency of AI infected poultry coming to PCFs, determine the serology status of spent layer and parent stock coming to PCFs, and determine the source farm/region of AI infected poultry coming to PCFs.

Material and Method

The study was conducted for 11 months, starting from April 2009 until March 2010 in 40 PCFs in DKI Jakarta province. Each PCF was observed for a week in each observation period (10 weeks), therefore in total every PCF was observed for 4 weeks in 4 different observation periods during the study. Sentinel chicken observation was conducted for 1 month in October. Samples were collected from chickens coming to PCFs, the PCF environment, and sentinel chickens. A total of 10 tracheal swab samples and serum samples (only for spent layer and parent stock) were collected from every incoming batch. Sampling was prioritized firstly on dead birds, sick birds, and finally healthy birds. Sampling was limited to a maximum of 10 batches per day. A batch is defined as a poultry delivery from one farm in one day to one PCF. Environmental samples were collected from holding pens in PCFs once a week. In sentinels, tracheal swab samples were collected from dead sentinels that died during the observation period and tracheal swab and serum samples were collected from all remaining live sentinels at the end of the observation period. Besides sample collection, data from each batch that came to PCFs was collected using questionnaires. Tracheal swab and environmental samples were tested with reverse transcription-Polymerase Chain Reaction (rt-PCR) to detect H5 AI virus antigens, while serum samples were tested for H5 AI antibodies with the Hemagglutination Inhibition (HI) test. Data collected through questionnaire and laboratory testing was analyzed descriptively.

Result and Discussion

Testing of tracheal swab samples found (H5) AI in 3.26% of batches that came to 37.5% of PCFs. The low number of infected batch is consistent with the overall low report of AI incidence in poultry in 2009-2010 (EMPRES/FAO-GLEWS, 2010). Even though the percentage of AI infected batch is relatively low but the batches were consistently found in certain PCFs that receive most of their supply from Banyumas district, totaling at 13 batches.

Testing of environmental samples found AI in 30% of PCFs, which is lower than the percentage of PCFs receiving infected batches. This finding could be the result of AI viruses not detected in some PCFs because the number of infected batches was so small or because environmental samples were collected from the floor of chicken pens where there are many organic materials that could inhibit the testing process.

Serologic testing of spent layers and parent stock found most chickens (69.4%) had GMTs > 2 log 4. A GMT more than 2 log 4 is classified as protective against AI (DGLS 2006), meaning that it could prevent chickens from being sick or dying. However, the study found AI positive tracheal swab samples which indicate the chickens were still shedding AI viruses.

The study also found AI positive sentinels in 80% of PCFs, which indicates AI virus circulation within the pens of the PCFs.

Throughout the study, the highest supply of AI infected birds came from Lampung province (15%), Central Java province (11.8%), and DI Yogyakarta province (11.4%).

Conclusion

AI virus was found in batches, the PCF environment, and sentinel chickens. AI virus circulation in PCFs is quite high as 80% of PCFs involved in the study were found infected. The highest percentage of AI infected batches came from Lampung, Central Java and DI Yogyakarta provinces. Also, a large percentage of spent chickens coming to PCFs had antibody titers > 2log 4.

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