

# A PRELIMINARY STUDY TO UNDERSTAND THE STATUS OF NEWCASTLE DISEASE AND AVIAN INFLUENZA DISEASE IN SABAH

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**ABSTRACT.** A study was conducted to determine the prevalence of Newcastle disease (ND) and Avian Influenza (AI) from backyard chickens and ducks in Sabah. A total of 2,117 samples consisting of 1,498 swabs and 619 serum samples were taken from all districts in the state. All samples tested were negative to Avian Influenza virus. 23.59% of the 619 serum samples collected were sero-positive for Newcastle Disease with the highest HI titre being 1/256. Only one pool of 4 tracheal swabs or 0.27% of the total 1,498 swabs was positive on virus isolation for Newcastle Disease. No Avian influenza virus was isolated from all the samples collected.

*Keywords:* Newcastle disease, Avian Influenza, Sabah, prevalence

## INTRODUCTION

Sabah is known for its freedom from many major livestock diseases, including Foot and Mouth disease for which the state has been officially declared free by OIE since 2004. Hence it is of paramount importance that proactive measures are continuously

in place to monitor the presence and/or any impending entry of exotic diseases into the state.

As a result of the emergence of avian influenza epidemics in many Asian countries in the late 2004, it was therefore necessary to continuously assess the health status of the poultry populations in Sabah. A national survey on AI and ND was conducted, for which Sabah was also included. This paper reports the outcome of the survey, which was conducted based on the guidelines given by the Department of Veterinary Services Malaysia.

## MATERIALS AND METHODS

A systemic collection of samples from three (3) premises each for backyard chickens and ducks for 41 districts/sub-districts in all six divisions in the state was designed. Premises were randomly selected and samples comprising 4 serums, 4 tracheal swabs and 4 cloacal swabs were collected from each premise. The study was undertaken from 1st December 2010 till 11th February 2011.

**Table 1:** Summary of samples collected for the study

Division	Cases	Tracheal swabs	Cloacal swabs	Serum
Beaufort	36	144	144	132
Kota Kinabalu	37	148	148	137
Kudat	43	172	172	133
Keningau	27	108	108	56
Sandakan	22	88	88	76
Tawau	24	89	89	85
<b>Total</b>	<b>189</b>	<b>749</b>	<b>749</b>	<b>619</b>

A total of 2,117 samples from backyard chickens and ducks comprising of 749 tracheal swabs, 749 cloacal swabs and 619 serum samples were collected and sent to the Makmal Diagnosa Veterinar Kota Kinabalu to test for both diseases.

A summary of samples collected for analysis is shown in Table 1:

All serum samples for AI detection were subjected to Agar Gel Precipitation Test (AGPT) and Enzyme-Linked Immunosorbent Assay (ELISA). Haemagglutination Inhibition (HI) tests were conducted to determine the presence of ND. Tracheal and cloacal swabs were inoculated into fertilized eggs for virus isolation. Test methods procedures for AGPT, HI and Egg Inoculation were modified based on OIE (2009) for both diseases. Figure 1 shows the test methods procedures for the serum samples.

## RESULTS

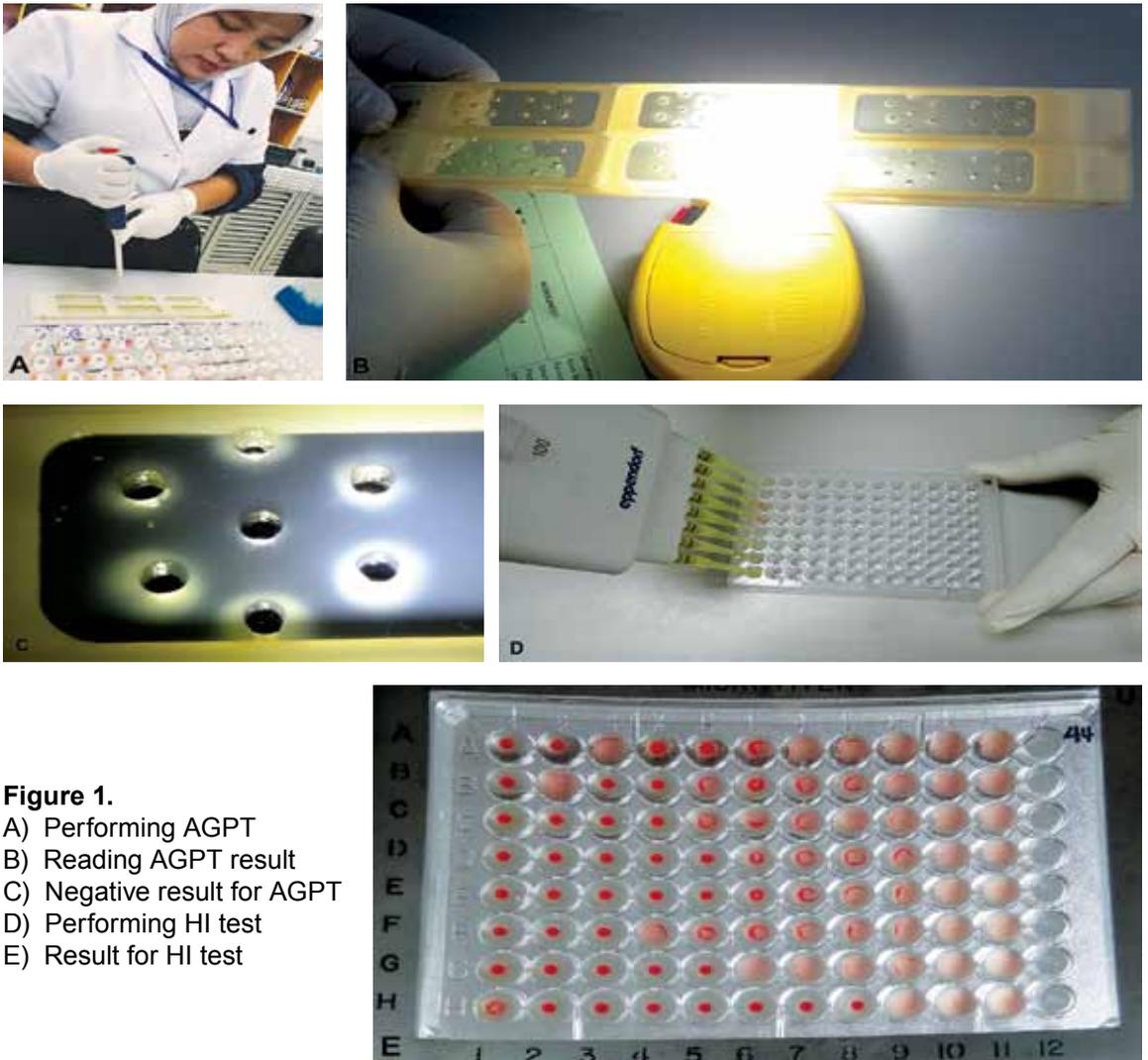
The result of tests for AI is shown in Table 2. All samples showed negative results to both the AGPT and ELISA.

**Table 2.** Result of AI detection using AGPT and ELISA

Division	Total	Number of positive AGPT	Number of positive ELISA
Beaufort	132	0	0
Kota Kinabalu	137	0	0
Kudat	133	0	0
Keningau	56	0	0
Sandakan	76	0	0
Tawau	85	0	0
	619	0	0

Correspondingly, no virus was isolated for AI from all the samples tested. However a pool of four tracheal swabs was positive on virus isolation for ND. This represented 0.27% of the total swabs taken for isolation. A summary of the results for virus isolation is shown in Table 3:

Serologically, HI titre values for ND were fairly low with 76.41% sero-negative samples compared to 23.59% sero-positive samples. The highest value was 1/256 from 0.16% or 1/619 samples. Table 4 shows the HI titre values from each division.



**Figure 1.**  
 A) Performing AGPT  
 B) Reading AGPT result  
 C) Negative result for AGPT  
 D) Performing HI test  
 E) Result for HI test

**Table 3.** Table depicting the results of isolation for both the AI and ND viruses

Division	Number samples	Number of positive AI	Percentage of positive AI (%)	Number of positive ND	Percentage of positive ND (%)
Beaufort	288	0	0	0	0
Kota Kinabalu	296	0	0	0	0
Kudat	344	0	0	0	0
Keningau	216	0	0	0	0
Sandakan	176	0	0	4	0.27
Tawau	178	0	0	0	0
Total	1,498	0		4	

**Table 4.** Results of ND titre using HI test

Division	ND Titre									Total
	Negative	1/256	1/128	1/64	1/32	1/16	1/8	1/4	1/2	
Beaufort	105							8	19	
Kota Kinabalu	114	1	1			1		3	17	
Kudat	83		1	5	2	1	5	9	27	
Keningau	41				1	4	1	3	6	
Sandakan	59							5	12	
Tawau	71							3	11	
<b>Total</b>	<b>473</b>	<b>1</b>	<b>2</b>	<b>5</b>	<b>3</b>	<b>6</b>	<b>6</b>	<b>31</b>	<b>92</b>	<b>619</b>
Percentage (%)	76.41	0.16	0.32	0.81	0.48	0.97	0.97	5.01	14.86	

## DISCUSSION

This study reaffirms that Sabah is free from Avian Influenza. As the samples collected were representative of all divisions in the state, it thus provides a true general indication of the disease in the whole of Sabah. There were neither signs nor symptoms of the disease (AI) observed or reported during the period of sample collection.

It is important to include village/backyard poultry population in this study as mostly open and extensive ranches are more prone to exposure by pathogens compared to closed house systems. An assessment on such flocks provides an excellent epidemiological understanding of the actual health status of poultry population in the state.

Newcastle disease (ND) is reportedly a common poultry disease amongst villages or backyard farm chickens. This is in line with the study which showed a 23.59 % or 146 sample sero-positive tested

on HI for the disease. Commonly known as 'busau' in the local language in Sabah, this disease is sporadic in nature and is under control through vaccination. Although most titre values for HI were fairly low suggesting of either low infection or poor vaccination response, one sample reach a titre value of 1/256. However the status of vaccination was not highlighted in this survey. The less than one percent (0.27%) of sample positive for virus isolation from pooled tracheal swabs explain the low infectivity of the disease in the flocks.

## REFERENCES

1. OIE Terrestrial Manual 2009

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