



UNIVERSITI PUTRA MALAYSIA

**THE IMMUNE STATUS OF INDIGENOUS FOWL (GALLUS
DOMESTICUS) TO COMMON POULTRY DISEASES**

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By

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ROSLEE B. IBRAHIM

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ABSTRACT

A serological survey was carried out to detect and identify the disease present in the indigenous fowl flocks in UPM Quarters, Serdang Jaya, Pucong, Sungei Besi, Kajang, Beranang and Sepang. A total of 25 flocks which comprised of 233 birds were involved in the survey. There was no vaccination practiced in most of the flocks surveyed.

The results indicated that the antibody titre was significant for Infectious Bronchitis (IB) but not for New Castle Disease (ND). More birds were positive for Mycoplasma gallisepticum infection than for Pullorum Disease.

Results from the challenge test indicated that the unvaccinated indigenous fowls were also susceptible to virulent strain of New Castle Disease virus. The birds that died from the challenge showed severe visceral lesions. Susceptibility to virulent Infectious Bronchitis virus seem to be less since there was no obvious gross lesion seen on autopsy although some of the IB-challenge birds produced sneezing and rales sound.

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ABBREVIATIONS AND SYMBOLS

CRD	Chronic Respiratory Disease
EID ₅₀	50% Embryo Infective Dose
GMT	Geometric Mean Titre
HI	Haemagglutination Inhibition
IB	Infectious Bronchitis
IBV	Infectious Bronchitis Virus
Mg	Mycoplasma gallisepticum
Mort.	Mortality
ND	New Castle Disease
NDV	New Castle Disease Virus
No.	Number
RSAT	Rapid Slide Agglutination Test
S.D	Standard Deviation
.Surv.	Survival
(χ^2)	Chi-Square Test

1. INTRODUCTION

Oh Beng Tat (1981) categorised the indigenous fowl (Gallus domesticus) rearing as the traditional system of production. The chickens are of small body size and dual-purpose type. They have unlimited freedom during the day and left to scavenge for themselves whatever the natural food they can find and sometimes they are also given house-hold left over with occasional grain supplement (17,21):

Oh Beng Tat (1984) stated that an average size of 12 local birds per house-hold provided cheap eggs and meat for consumption, a very efficient disposal system by converting every grain left over into valuable protein food and also produced about 365 kg of chicken manure per year which are valuable fertilizer for fruit trees around the compound from which the farmers get an extra income.

It was estimated that over three quarter of a million rural families in Peninsular Malaysia still keep this small flocks of indigenous fowl (22) and this system of indigenous fowl rearing still seem to play an important role in the production of poultry in South-East-Asia (ASEAN) countries (Table 1).

Table 1: ESTIMATED FIGURES OF THE INDIGENOUS FOWL IN ASEAN COUNTRIES

Countries	Estimated Number of • Indigenous Fowl (in million)		% of the Estimated Total Number of Birds
Peninsular Malaysia	6.45	(1983)	24.96
Thailands	130.00	(1979)	61.85
Indonesia	120.00	(1983)	60.00
Philippines	33.29	(1982)	57.28

Source: Oh Beng Tat (1984) and Poultry International (March, April & May 1984)

Serological survey on some poultry disease have been carried out in the commercial farms (23) and in small-holder farms in Beranang and Kuala Langat (20), however no such studies in the indigenous fowl flocks has been reported so far. Hence, the objectives of this serological survey are to study the health status, to detect the presence of antibody for New Castle Disease (ND), Infectious Bronchitis (IB), Mycoplasma gallisepticum (Mg) infection and Pullorum Disease and to determine the susceptibility of the indigenous fowl to ND and IB.

2. LITERATURE REVIEW

It was estimated that the Total Annual Poultry Production in Peninsular Malaysia in 1983 was 112 million Ringgit (excluding the ducks) and out of this, 18.5 million Ringgit (16.24%) were locally produced from small scale and backyard operations of the local indigenous stock of 'Kampong Fowl' kept by rural households. This value comprised of 150 million table eggs (0.056% of total eggs production) and 17000 metric tons of meat (12% of the meat production)(22

Although a number of studies on the indigenous fowl has been carried out since 1950's, most of them are non-serological studies. Those reported studies were based on the endoparasitic aspect (14,15), food intake and growth rate (6,9), laying pattern (8,11), morphological and genetical inter-relationship between jungle fowl and domestic fowl (29) characteristics of the carcass and meat of indigenous fowls (12), physiological and production performances (10), and the morphometric diffusing capacity for oxygen (O_2) for the lung

of domestic and jungle fowl (31).

Free ranged systems of management of indigenous fowl would encourage the spread of infectious diseases because the majority of the poultry keepers have only small area of land and boundaries between adjoining holding which form no obstacle to the movement of fowls (28). In natural brooding, chicks mortality of the indigenous fowl was as high as 60-70% during the rainy seasons (21).

Opitz et al. (1976) reported that Chronic Respiratory Disease (CRD), Pullorum Disease, ND, IB and helminthiasis were the most commonly observed disease in the commercial farm in Selangor and Negeri Sembilan. He also reported that IB has a wide spread incidence, an important trigger of CRD in young chickens and often diagnosed in broiler flock which were 3 weeks and older. More than 50% of the chicks have no detectable or a very low level of circulating HI-antibodies against ND (23). IB was found to be the primary problem in the small-holder broiler flocks in Beranang and Kuala Langat (75% and 100% of the flocks respectively), but not ND (20).

It was suggested that the mild nature of Pullorum Disease in Malaysia may probably be related to the system of husbandary and method of hatching, however the spread of infection under village condition is not likely to be as serious as under the intensive or semi-intensive system (5).

Mycoplasma gallisepticum, the causal agent of CRD has a wide spread of incidence in chicken commercial farms (43.7% of the tested farms) (23) and in small-holder broiler flocks in Beranang and Kuala Langat (75% and 100% of the flocks respectively) (20).

3. MATERIALS AND METHODS

UPM Quarters, Serdang Jaya, Pucong, Sungei Besi, Kajang, Beranang and Sepang were visited in May 1984 for the purposes of the survey. A total of 25 flocks which comprised of 233 birds were involved in this study.

The health status of the flocks was evaluated from the clinical observation and the history obtained by carrying out a formal questionnaire survey by personal interview methods with the farmers (APPENDIX I-A).

Serum samples were collected from the flocks surveyed and tested for ND (3), and IB (2,7) using Haemagglutination Inhibition (HI) Test, Mycoplasma gallisepticum using Rapid Slide Agglutination Test (RSAT) (13,27) and Pullorum Disease using Rapid Whole Blood Test (13).

20 unvaccinated indigenous fowls were challenged against ND and IB. The birds were challenged 'intranasally' and 'intraocularly' by inoculation of 0.1 ml of 1×10^{-6} EID₅₀ of VRI Virulent Field Strain NDV (designated Ipoh 2240-220)/chicken (5 birds) and 0.1 ml of 10^{-4} EID₅₀ of M-41 Virulent Strain IBV (obtained from Weybridge, United Kingdom)/chicken (5 birds) while another 10 birds (5 for ND and 5 for IB) were challenged by 'incontact' method. The birds for ND and IB were placed in separate isolation houses and they were allowed to mingle with the broiler birds challenged by 'intranasal' and 'intraocular' inoculation of the similar strain of NDV and IBV in the same isolation unit. All the survivors were bled thrice (day 0, 9 and 15) and were examined twice daily for a period of 14 days.

4. RESULTS

4.1 Health Status and History of the Flocks Studied

All the flocks studied practiced a free-range system of rearing. The sheds were very small and low, improperly roofed and ventilated. No vaccination, disinfection and use of prophylactic agents was practiced in most of the flocks surveyed. There was a history of unknown disease outbreak in which most of the affected birds died within 2 to 3 days. ND outbreak was confirmed in the indigenous fowls in Sungei Besi areas previously (1).

Since there was no appropriate records kept by the owner, the age of the birds were only estimated from observation and from questionnaires (APPENDIX I-B).

4.2 Results of the Serological Survey

From Table 2, it was found that most of the birds have a very low ND-HI antibody titre (below $\log_2 5$) while 42.06% of the birds have a titre of 0. During the survey, it was found that one of the birds from Kajang showed sign of torticollis and on autopsy, there was haemorrhage of proventriculus and caecal tonsil and haemorrhagic enteritis. Similar finding were obtained from another bird in the same flock which died of suspected ND.

Table 3 showed that most of the indigenous fowls surveyed have a high IB-HI titre, with a range of $\log_2 6-8$ which might indicate that most of the birds were infected at the time the survey was done. However, there was no clear evident of clinical symptoms seen except for few birds that were having rales sound.

Results from Rapid Whole Blood Test indicated that only 8.12% of the birds were found to have positive sera against *Salmonella Pullorum* infection (Figure 1) and this positive birds were from Kajang, Beranang and Sepang (Table 4). Figure 1 also showed that only 22.65% of the birds surveyed were positive for *Mycoplasma gallisepticum*. Most of the positive sera were obtained from the birds in Beranang, Kajang and Sungei Besi (Table 4)..

4.3 Results of the Challenge Test

All the challenge birds were unvaccinated and having ND-HI titre of 0.10 ± 0.316 and IB-HI titre of 2.70 ± 1.337 on the day of challenge.

For NDV challenge, the antibody titre increased drastically during the first week of challenge in which at day 9, the HI titre was $\log_2 2.75$ for the incontact group and $\log_2 7$ in the inoculated group and maintain at $\log_2 7$ in the survivors of the inoculated group at day 15th (Table 6a).

During the period of challenge with IBV, the IB-HI titres increased moderately with a range of $\log_2 2-6$ at day 9th and $\log_2 3-7$ at day 15th (Table 6b). From RSAT done pre-challenge, it was found that only one of the birds in the IBV challenge group had positive sera against *Mycoplasma gallisepticum*. However, on the 15th day after challenge, it was found that six out of ten birds had positive sera against *Mycoplasma gallisepticum*.

The clinical signs, post-mortem finding and the histopathological changes seen in the challenged birds are shown in Table 6c.

Table 2: HAEMAGGLUTINATION TITRE FOR NEW CASTLE DISEASE

Area	Age Group	Number of Samples	GMT* (log ₂) + SD**	Range (log ₂)	Standard Error
UPM Quarters	Young, adults and older	28	1.214 + 1.572 ^a	0-5	0.297
Serdang Jaya	Adults and older	33	0.788 + 1.341 ^{ba}	0-4	0.233
Pucong	Adults	7	4.286 + 1.706 ^c	3-7	0.644
Sungei Besi	Young, adults and older	34	3.735 ± 2.165 ^{dc}	1-7	0.371
Kajang	Young and adults	48	2.200 ± 1.946 ^e	0-6	0.281
Beranang	Young and adults	47	0.680 ± 1.520 ^{fab}	0-6	0.222
Sepang	Adults	37	1.540 + 1.820 ^{gabe}	0-6	0.299

GMT* (log₂): Geometric Mean Titre

SD** : Standard Deviation

Values with similar super-script are not significant at 'V' degree of freedom and 5% level of significance for Student's-T-test, where 'V' are variables.

Table 3: HAEMAGGLUTINATION TITRE FOR INFECTIOUS BRONCHITIS

Area	Age Group	Number of Samples	GMT* (log ₂) + SD**	Range (log ₂)	Standard Error
UPM Quarters	Young, adults and older	28	4.214 ± 2.394 ^a	1-9	0.452
Serdang Jaya	Adults and older	33	5.454 + 2.563 ^{ba}	0-9	0.446
Pucong	Adults	7	6.143 + 1.676 ^{cab}	4-8	0.633
Sungei Besi	Young, adults and older	34	7.265 + 1.912 ^{dc}	2-9	0.328
Kajang	Young and adults	48	4.617 + 1.739 ^{eab}	0-8	0.422
Beranang	Young and adults	47	4.702 ± 2.095 ^{fabce}	0-8	0.306
Sepang	Adults	37	4.324 ± 1.973 ^{gaef}	0-7	0.324

GMT* (log₂): Geometric Mean Titre

SD** : Standard Deviation

Values with similar super-script are not significant at 'V' degree of freedom and 5% level of significance for Student's-T-test, where 'V' are variables.

Table 4: RESULTS OF RSAT FOR MYCOPLASMA GALLISEPTICUM AND RAPID WHOLE BLOOD TEST FOR PULLORUM DISEASE

Area	Age Group	Number of Samples	Mg RSAT Test		Pullorum Test	
			+ve	-ve	+ve	-ve
UPM Quarters	Young, adults and older	28	6/28	22/28	-	28/28
Serdang Jaya	Adults and older	33	4/33	29/33	-	33/33
Pucong	Adults	7	1/7	6/7	-	7/7
Sungei Besi	Young, adults and older	34	9/34	25/34	-	34/34
Kajang	Young and adults	48	13/48	35/48	7/48	41/48
Beranang	Young and adults	47	15/47	32/47	7/47	43/47
Sepang	Adults	37	5/37	32/37	8/37	29/37

** indicates significant at 'V' degree of freedom (where 'V'=6) and 5% level of significance for Chi-Square Test (χ^2).

Table 5: PERCENTAGE POSITIVE SERA PRESENT IN THE INDIGENOUS FOWL FLOCKS IN THE AREAS SURVEYED

Area / Disease	New Castle Disease	Infectious Bronchitis	Pullorum Disease	Mycoplasma gallisepticum
UPM Quarters	3.57	46.43	0	21.43
Serdang Jaya	0	63.64	0	12.12
Pucong	42.86	71.43	0	14.29
Sungei Besi	47.07	88.24	0	26.47
Kajang	16.67	63.83	14.58	27.08
Beranang	6.38	61.70	8.51	31.92
Sepang	8.12	54.05	21.62	13.51

Figure 1: SUMMARY OF ND, IB, Mg AND PULLORUM DISEASE



Table 6a: RESULT OF VIRULENT NEW CASTLE DISEASE VIRUS CHALLENGE IN UNVACCINATED INDIGENOUS FOWLS

Method of Challenge	No. of Chicken	Day 0			Day 9			Day 15				
		HI-Titres*	Mort.**	%Surv.***	No. of Chicken	HI-Titres	Mort.	%Surv.	No. of Chicken	HI-Titres	Mort.	%Surv.
I/C ⁺	5	0	0	100	4	2.75+2.217	1	80	0	-	5	0
I/N&I/O ⁺⁺	5	0.20+0.447	0	100	2	7.00+1.414	3	40	2	7.00+1.414	0	40

Table 6b: RESULT OF VIRULENT INFECTIOUS BRONCHITIS VIRUS CHALLENGE IN UNVACCINATED INDIGENOUS FOWLS

Method of Challenge	No. of Chicken	Day 0			Day 9			Day 15				
		HI-Titres*	Mort.**	%Surv.***	No. of Chicken	HI-Titres	Mort.	%Surv.	No. of Chicken	HI-titres	Mort.	%Surv.
I/C ⁺	5	2.20+1.304	0	100	5	4.20+1.483	0	100	5	4.80+1.095	0	100
I/N&I/O ⁺⁺	5	3.20+1.304	0	100	5	4.40+0.547	0	100	5	5.80+1.789	0	100

HI-Titres : Haemagglutination-inhibition titres given in term of GMT (\log_2) \pm SD.

HI-Titres* : Haemagglutination-inhibition titres given in term of GMT (\log_2) \pm SD.

Mort. : Mortality and %Surv. : % Survival.

I/C⁺ : Incontact challenged and I/N & I/O⁺⁺ : Intranasal and Intraocular challenged.

No. of chicken : No. of chicken that still survived during that particular period of challenged.

Table. 6c: CLINICAL RESPONSE, POST-MORTEM FINDING AND HISTOPATHOLOGICAL CHANGES IN UNVACCINATED INDIGENOUS FOWLS CHALLENGED WITH VIRULENT NEW CASTLE DISEASE AND INFECTIOUS BRONCHITIS

RESPONSE TO CHALLENGE	NEW CASTLE DISEASE CHALLENGE	INFECTIOUS BRONCHITIS CHALLENGE
CLINICAL RESPONSE	Day 6th & 7th: 3 inoculated birds died while between day 8th to 12th: all the incontact birds died. Two inoculated birds remain survived - one healthy and one showed torticollis sign. Death was preceded by a short period of illness, weak, depressed, not eating and sometimes gasping with neck extended. 2 birds had coughing and produced gurgling sound, 2 with a jerking head movement.	Day 4th: birds started showing sign of coughing and sneezing. At the end of the challenge, 4 inoculated and 4 incontact birds showed occasional gasping, coughing and sneezing. 7 of them produced rales sound. Generally, the signs observed were very mild. 2 birds did not show any clinical signs.
POST-MORTEM FINDING	The most consistent lesions was haemorrhage of the proventriculus, gizzard, caecum and duodenum as well as the necrosis and haemorrhage of the caecal-tonsil. Crop was distended with water. Lesion in the respiratory tract were generally mild and infrequent, with two inoculated birds had haemorrhagic tracheitis, opacity of air sac and congestion of the lungs. Few birds had haemorrhagic bursa.	All the 10 birds were sacrificed at the end of the challenge. Only two birds had very thin plug of mucus in the trachea and one had nasal discharge. In all birds, the kidney was slightly swollen and pale. Most of the birds appeared to be normal with no other significant gross lesions. This indicate that the birds might be only mildly infected.
HISTO-PATHOLOGICAL CHANGES	Brain of the bird with the torticollis sign:- inflammatory reaction in the cerebellum, vacuolated neurons, endotheliosis, increased perivascular space and oedema in the white matter of the cerebellum.	Revealed a mixed infection with <u>Myco. gallisepticum</u> :- epithelium of the trachea remains intact but deciliated and the mucous glands were obliterated, congested blood vessels and capillaries in the thickened mucosa of the trachea, diffuse infiltration of the subepithelial and the deeper layer of the mucosa with lymphocytes, plasma cell and histiocytes. Present of epithelial hyperplasia suggest the mixed infection with Mg. Kidney: glomerular and focal interstitial nephritis.

5. DISCUSSION AND RECOMMENDATIONS

5.1 New Castle Disease

Allan and Cough (1974) concluded that the vaccination titre was indicated by HI titre of \log_2 5-6 and a titre of 8 was indicative of immunity. HI titre of \log_2 7 was considered as indicative of protection against a challenge (4,31). According to the value given above, it was found that only 14.59% of the birds surveyed had positive sera (Figure 1). Most of them had a very low and unprotective ND-HI titer (below \log_2 4). The risk of ND outbreak is therefore high and a loss up to 50-70% of the total number of birds in a flock can be expected. This can cause a great economic loss to the farmers since most of them depend on this indigenous fowl as a source of protein as well as the source of side-income. Extension work should therefore be directed towards teaching the rural folks on the importance of vaccinating their chicken against the common poultry diseases such as ND and IB (23).

5.2 Infectious Bronchitis

According to Mac Pherson and Feest (1978), the IB-HI titres for the clinically affected birds were greater than \log_2 6 while Newman (1979) gave a titre of \log_2 5-6 with a range of 0-9. Normal uninfected or negative sera have a titre of \log_2 2-3 (2). Based on the value given by Newman (1979), it was found that 18 out of 25 flocks surveyed were positive for IB. Table 5 and Figure 1 showed that IB has the highest incidence among all the four diseases tested. It was also found that three out of four flocks of birds kept nearby or together with commercial birds

were found to be positive for IB (Table 5 & APPENDIX I-B). The possible reasons were that IBV may be transmitted from the commercial birds flocks to the indigenous fowl flocks by direct air-borne transmission but may also due to free range system practiced in which the birds have unlimited freedom and can have contact with the infected birds nearby. Hence it is advisable to restrict the birds in an adequate but confined-fenced area such as under young rubber holding (16).

5.3 Mycoplasma gallisepticum Infection

Table 5 and Figure 1 showed that Mg infection has a second highest incidence, after IB, in all the areas surveyed. It was thought that IB infection seem to play a more important role as the predisposing factor to Mg (23) in this case since most of the birds that are positive for IB were also positive for Mg and also Mg have been detected in six out of ten birds challenged with virulent IBV.

Although from the results obtained, 22.65% of the birds surveyed were found to have positive sera against Mg, this value may not be representative for absolute infection with Mg since there is a possibility of false positive RSAT reactions due to one way cross-reaction of sera from birds infected with Mycoplasma synoviae reacted with Mg antigen (27

For control of Mg, drugs such as Tylosin can be incorporated in the drinking water at 0.5 mg/litre (20). In cases of outbreak, all the feeders and drinkers provided should be washed thoroughly with detergent, disinfect and dried under strong sunlight (23).

5.4 Pullorum Disease

From Table 5 and Figure 1, it showed that the percentage of positive sera obtained was very low. This indicate that the disease is not widespread in the area, however those birds with positive sera might act as a chronic or potential carrier.

For control, Furazolidone at concentration of 0.04% in the food given for 10 days is highly effective in reducing mortality in chicks and reducing the number of adult carriers as well as to decrease or even eliminate the laying of infected eggs (13).

5.5 Significance of the Results

ND-HI titres of the flocks in all areas were compared and found to be significant at 'V' degree of freedom (where 'V' is a variable) and 5% level for Student-T-Test except for the flocks in Serdang Jaya vs UPM Quarters, Sungei Besi vs Pucong, Beranang vs UPM Quarters & Serdang Jaya and Sepang vs UPM Quarters as well as Serdang Jaya & Kajang.

Titres for IB-HI were found mostly not significant when compared at 5% level except for those flocks in UPM Quarters.

6. CONCLUSION

From the serological tests carried out, it was found that IB has the highest wide-spread incidence in most of the indigenous fowl surveyed. A very mild clinical symptoms seen in the birds challenged with virulent IBV suggest that the antibody present in those challenged birds are protective

although they were never vaccinated against IB.

Mg infection has a second highest incidence in most of the indigenous fowl flocks surveyed and it was thought that the incidence might be related to the high incidence of IB which act as a predisposing factor.

The low percentage positive sera and the low antibody titre obtained in ND-HI Test indicate that ND would be a problem in the indigenous fowl flocks in case of outbreak.

The incidence of the Pullorum Disease in the indigenous fowl was found to be low, however the presence of few carrier birds in the flocks may create a problem of outbreak in future

Extension work should be directed towards teaching the rural folks on the importance of building a better housing condition which are well-ventilated, made up of cheap material and have an adequate surface area in order to prevent overcrowding. They should also be taught on the advantage and importance of the use of artificial brooding and vaccination against the common poultry disease in Malaysia such as ND, in order to reduce early chicks mortality as well as to help them to produce healthy indigenous fowl in the future.

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QUESTIONNAIRE

(I) GENERAL INFORMATION

Name of Owner:

Address of Owner:

Types of Farming: Mixed OR Integrated OR Backyard

Flock No. and Size:

No. of Samples Collected:

Age Group:

Breeds:

Source of Birds:

Other Poultry:

(II) MANAGEMENT PRACTICES

(a) HOUSING: Roof: Zinc OR Attap OR Others

Wall: Wood OR Others

Floor: Raised Flooring (Slatted Wood or
Wire) OR Split Level Flooring

(Deep Litter and Raised Flooring)

(b) EQUIPMENT PROVIDED:

Feeders:

Drinkers:

Nest Boxes for Laying Hens:

Nest Boxes for Day-Old-Chicks:

(c) FEEDING: House-hold Left Over OR Natural Feed
Resources OR Grain/Concentrate/Others

(d) BROODER: Natural Brooding OR Kerosene Lamp OR
No Heating Provided

(III) FLOCK HISTORY

(a) VACCINATION:

Vaccinated OR Not Vaccinated:

Type of Vaccination:

When It is Vaccinated:

Vaccination Service Given By:

(b) PROPHYLACTIC MEDICATION:

Anti-stress OR Deworming OR Insecticides
OR Coccidiostat OR Antibiotics OR Others

(c) DISSINFECTANT:

Dissinfectant Used:

Method of Disinfections:

Frequency of Shed Cleaning and Disinfections:

(d) PREVIOUS AND PRESENT DISEASE PROBLEM:

When:

How Often:

Observed Clinical Signs:

Mortality:

(IV) REMARK AND EVALUATION

(a) MANAGEMENT:

Very Good OR Good / Poor OR Very Poor

(b) HYGIENE: Satisfactory OR Not Satisfactory

(c) SUGGESTIONS OF IMPROVEMENT:

Better Housing:

Sanitation and Prophylactic Measures:

Prevention of Disease in Future Flocks:

RESULTS OF THE SURVEY

(APPENDIX I-B)

AREA: UPM QUARTERS

	FLOCK 1	FLOCK 2	FLOCK 3	FLOCK 4
I. GENERAL INFORMATION				
Owner:	Encik Wahab	Encik Sharif Adam	Puan Asmah	Encik Hussain Ismail
Address:	H-72, UPM Quarters	H-20, UPM Quarters	H-19, UPM Quarters	H-6, UPM Quarters
Types of farming:	Backyard	Backyard.	Backyard	Backyard
Flock size:	20 birds	10 birds	11 birds	11 birds
No. of samples:	15 samples	7 samples	5 samples	3 samples
Age group:	12 adults, 2 young and 1 old	5 adults and 7 young	7 adults and 4 day-old chicks	8 day-old chicks, 2 hens and 1 cockerel
Source of birds:	From relatives	From relatives	From relatives	From relatives
Other poultry:	3 broilers	None	None	None
II. MANAGEMENT PRACTICES				
HOUSING:-				
Roof:	Zinc	Zinc	Zinc	Zinc
Wall:	Wood	Wood	Wood and Zinc	Wood and Zinc
Floor:	Raised flooring	Raised	Raised flooring	Raised flooring
EQUIPMENT PROVIDED:-				
Feeders:	None	Modified tin of milk	None	None
Drinkers:	Yes	None	Small plastic type	Small plastic type
Nest boxes for laying hens and day old chicks:	Yes	Yes	Yes	Yes
FEEDING:-				
House-hold left over:	Yes	Yes	Yes	Yes
Natural feed sources:	Yes	Yes	Yes	-Yes-
Grain/Concentrate/Others:	Maize	Concentrate	Wheat	Concentrate
BROODER (if practices):-	Natural brooding	Kerosene lamp	Natural brooding	Kerosene lamp
III. FLOCK HISTORY				
VACCINATION:-				
Vaccinated/not vaccinated:	Not vaccinated	Not Vaccinated	Not Vaccinated	Not vaccinated
Type of vaccination:				
When it is vaccinated:				
Vaccination service given by:				
PROPHYLACTIC MEDICATION:-				
Anti-stress/Deworming/Insecticides/Coccidiostat /Antibiotic/Others:	None	None	None	None

DISINFECTION:-				
Disinfectant used:	None	None	None	None
Method of disinfections:				
Frequency of shed cleaning and disinfection				
PREVIOUS AND PRESENT DISEASE PROBLEM:-				
When:	End of 1983	Early 1984	Early 1984	None
How often:	Only once	Only once	Several times	
Observed clinical signs:	Unobserved but suspected ND	Unobserved but suspected ND	Unobserved but suspected ND	
Mortality:	Almost 100%	Almost 100%	Almost 100%	
IV. REMARKS AND EVALUATION				
Management:	Poor - a lot of faeces on the floor and ground, very dusty	Good - the floor of the shed and ground underneath is dry and clean	Good - clean surrounding ground and floor	Good - floor of the shed and ground underneath is dr. and clean
Hygiene:	unsatisfactory	Good	Satisfactory	Good

AREA: SERDANG JAYA

FLOCK 1

FLOCK 2

FLOCK 3

FLOCK 4

I. GENERAL INFORMATION

Owner:	Encik' Mond. Yabandi	Encik Sanak	Encik Daud	Encik Tusizan Rosman
Address:	100, Jalan Raya 6, Serdang Jaya.	90, Jalan Raya 6, Serdang Jaya	84, Jalan Raya 6,	82, Jalan Raya 6,
Types of farming:	Backyard	Backyard	Backyard	Backyard
Flock size:	15 birds	6 birds	11 birds	5 birds
No of samples:	6 samples	6 samples	6 samples	5 samples
Age group:	4 older male and 2 adult female	Adult	Adult female	Adults (4 months age)
Source of birds:	From relative	From relatives	From relatives	From relatives
Other poultry:	None	20 broilers	None	None

II. MANAGEMENT PRACTICES

HOUSING:-				
Roof:	Zinc	Zinc	Zinc	Zinc
Wall:	Wire-mesh	Wire-mesh	Wire-mesh	Wood
Floor:	Raised flooring	Raised flooring	Raised flooring	Raised flooring
EQUIPMENT PROVIDED:-				
Feeders:	Unused pottery	Made from wood	Yes	None
Drinkers:	Unused pottery	Plastic type (medium)	Yes	None
Nest boxes for laying hens and day old chicks:	Yes	Yes	Yes	Yes
FEEDING:-				
House-hold left over:	Yes	Yes	Yes	Yes
Natural feed sources:	Yes	Yes	Yes	Yes
Grain/Concentrate/Others:	Maize	Concentrate	Maize	None
BROODER (if practices):-	Natural brooding	Kerosene lamp	Kerosene lamp	Natural brooding

III. FLOCK HISTORY

VACCINATION:-				
Vaccinated/not vaccinated	Not vaccinated	Not vaccinated	Not vaccinated	Not vaccinated
Type of vaccination:	-	-	-	-
When it is vaccinated:	-	-	-	-
Vaccination service given by:	-	-	-	-
PROPHYLACTIC MEDICATION:-				
Anti-stress/Deworming/ Insecticides/Coocidiostat/ /Antibiotic/Others:	None	Vitamins supplements	None	None

DISSINFECTIGN:-

Disinfectant used:

None

None

None

None

Methods of disinfection

-

-

-

Frequency of shed

.

-

-

-

cleaning and disinfection

-

-

-

PREVIOUS AND PRESENT

DISEASE PROBLEM:-

When:

Mid-1983

None

None

None

How often:

2 or 3 times before

-

-

-

Observed clinical signs:

Unobserved but
suspected NO.

-

-

-

Mortality:

almost 100%

-

-

-

IV. REMARKS AND EVALUATION

Management:

Poor

Good - clean, well-
ventilated and
properly built shed
Good

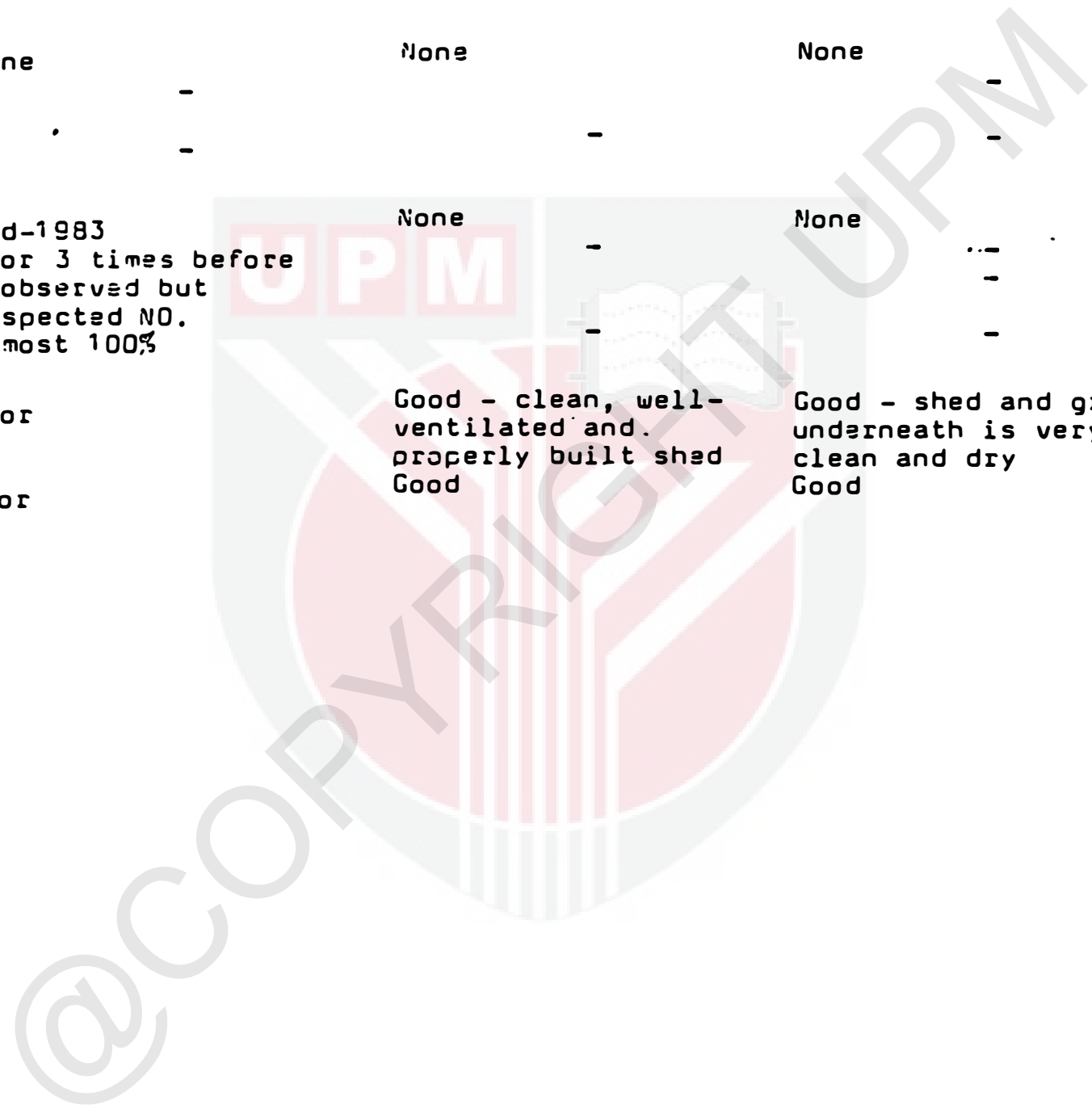
Good - shed and ground
underneath is very
clean and dry
Good

Unsatisfactory

Hygiene:

Poor

Unsatisfactory



AREA: KAJANG

FLOCK 1

FLOCK 2

FLOCK 3

FLOCK 4

I. GENERAL INFORMATION

Owner:	Encik Hussain	Encik Sudirman	Mr. Samy	Encik Hassan Jahar
Address:	Kg. Sg. Ramal Luar, Kajang	Kg. Sg. Ramal Luar, Kajang	Kg. Sg. Ramal Luar, Kajang	Kg. Sg. Ramal Dalam, Kajang
Types of farming:	Backyard	Backyard	Integrated	Backyard
Flock size:	20 birds	15 birds	7 birds	22 birds
No. of samples:	17 samples	10 samples	7 samples	13 samples
Age Group:	14 adults and 6 young	Adults	Adults	Adults
Source of birds:	From Chinese shop and from relatives	From relatives	From Chinese shop and friends	From relatives and friends
Other poultry:	300 broilers	None	200 broilers and ducks	Ducks

II. MANAGEMENT PRACTICES

HOUSING:-				
Roof:	Zinc	Zinc	Zinc	Zinc
Wall:	Wire-mesh	Wood	Wire-mesh	Wire-mesh
Floor:	Split level flooring	Raised flooring	Raised flooring	Raised flooring
EQUIPMENT PROVIDED:-				
Feeders:	None	None	Yes	Yes
Drinkers:	None	None	Yes	Yes
Nest boxes for laying hens and day old chicks:	Yes	Yes	Yes	Yes
FEEDING:-				
House-hold left over:	Yes	Yes	Yes	Yes
Natural feed sources:	Yes	Yes	Yes	Yes
Grain/Concentrate/Others:	Concentrate	Maize	Concentrate	Concentrate
BROODER (if practices):-	Natural brooding	Natural brooding	Natural brooding	Natural brooding

III. FLOCK HISTORY

VACCINATION:-				
Vaccinated/not vaccinated	Only the broiler birds were vaccinated.	Not vaccinated	Only broiler birds were vaccinated	Not vaccinated
Type of vaccination:	Ranikhet-F		Ranikhet-F	
When it is vaccinated:	Previous batch of broiler in 1983		Previous batch of broiler in 1983	
Vaccination service given by:	FKVSP, UPM.		Done by the owner	
PROPHYLACTIC MEDICATION:-				
Anti-stress/Deworming/Insecticides/Coccidiostat/Antibiotics/Others:	None	None	VISIN ^R against Coryza, Coccidia and pullorum	Sulphonamides obtained from chinese shops

DISSINFECTANT:-				
Disinfectant Used:	None	None	Calcium carbonate	None
Methods of disinfection	-	-	Spread under the sheds	-
Frequency of shed cleaning and disinfection	-	-	After each batch of broiler flocks	-
PREVIOUS AND PRESENT DISEASE PROBLEM:-				
When:	Outbreak occur in the broiler birds only, indigenous bird had no problem	None	After introduction of broiler birds in his farm	Early 1981
How often:	In every batch of broiler flocks	-	Mostly in broiler but rare in indigenous bird	Once a year
Observed Clinical signs:	Suspected to be ND	-	Depressed, twisted neck, lying down suspected ND	Unobserved but suspected to be ND
Mortality:	Very high	-	About 50%	About 50%
IV. REMARKS AND EVALUATION				
Management:	Good	Good	Good	Good
Hygiene:	Good	Good	Good	Good

AREA: BERANANG* AND PUCONG**

FLOCK 1*

FLOCK 2

FLOCK 1**

FLOCK 2**

I. GENERAL INFORMATION

Owner:	Encik Abdul Ghani	Encik Idris	Encik Bakar	Encik Rishwan
Address:	Kg. Sesapan Batu Rembau, Seranang	Kg. Sesapan Batu Minangkabau, Beranang	PG-2, UPM Quarters, Pucong	PG-5, UPM Quarters Pucong
Types of farming:	Backyard	Backyard	Backyard	Backyard
Flock size:	100 birds	30 birds	10 birds	15 birds
No of samples:	19 adults and 7 young	21 adults	3 adults	4 adults
Age group:	Adults and young	Adults	Adults	Adults
Source of birds:	From relatives	From relatives	From relatives	From relatives
Other poultry:	Duck and geese	Duck and geese	None	None

II. MANAGEMENT PRACTICES

<u>HOUSING:-</u>				
Roof:	Zinc	Zinc	No shed provided, birds	No shed provided, birds
Wall:	Wood and wire-mesh	wood and wire-mesh	spent their night on	spent their night on
Floor:	Split level flooring	Split level flooring	the tree	the tree
<u>EQUIPMENT PROVIDED:-</u>				
Feeders:	Yes	Yes	None	None
Drinkers:	Yes	Yes	None	None
Nest boxes for laying hens and day old chicks:	Yes	Yes	None	None
<u>FEEDING:-</u>				
House-hold left over:	Yes	Yes	Yes	Yes
Natural feed sources:	Yes	Yes	Yes	Yes
Grain/Concentrate/Others:	Wheat	Paddy and concentrate	None	None
BROODER (If practices):	Natural brooding	Natural brooding	Natural brooding	Natural brooding

III. FLOCK HISTORY

<u>VACCINATION:-</u>				
Vaccinated/not vaccinate	Vaccinated	Not vaccinated	Not vaccinated	Not vaccinated
Type of vaccination:	Ranikhet-F and S			
When it is vaccinated:	On March 1984			
Vaccination Service given by:	Beranang's Veterinary Service			
<u>PROPHYLACTIC MEDICATION:</u>				
Anti-stress/Deworming/ Insecticides/Coccidiostat/ /Antibiotics/Others:	None	None	None	None

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DISINFECTION:-

Disinfectant used:

Methods of disinfection

Frequency of shed

cleaning and disinfection

PREVIOUS AND PRESENT

DISEASE PROBLEM:-

When:

How often:

Observed clinical signs:

Mortality:

IV. REMARK AND EVALUATION

Management:

Hygiene:

None

-

None

-

None

-

None

-

Last year

At the time bloods
were collected

None

End of 1933

Rare

Oftenly occur

-

Once a year

Unobserved

Suspected ND

-

Suspected ND

Low

11 birds were died

-

Almost 100%

Good

Good

Poor

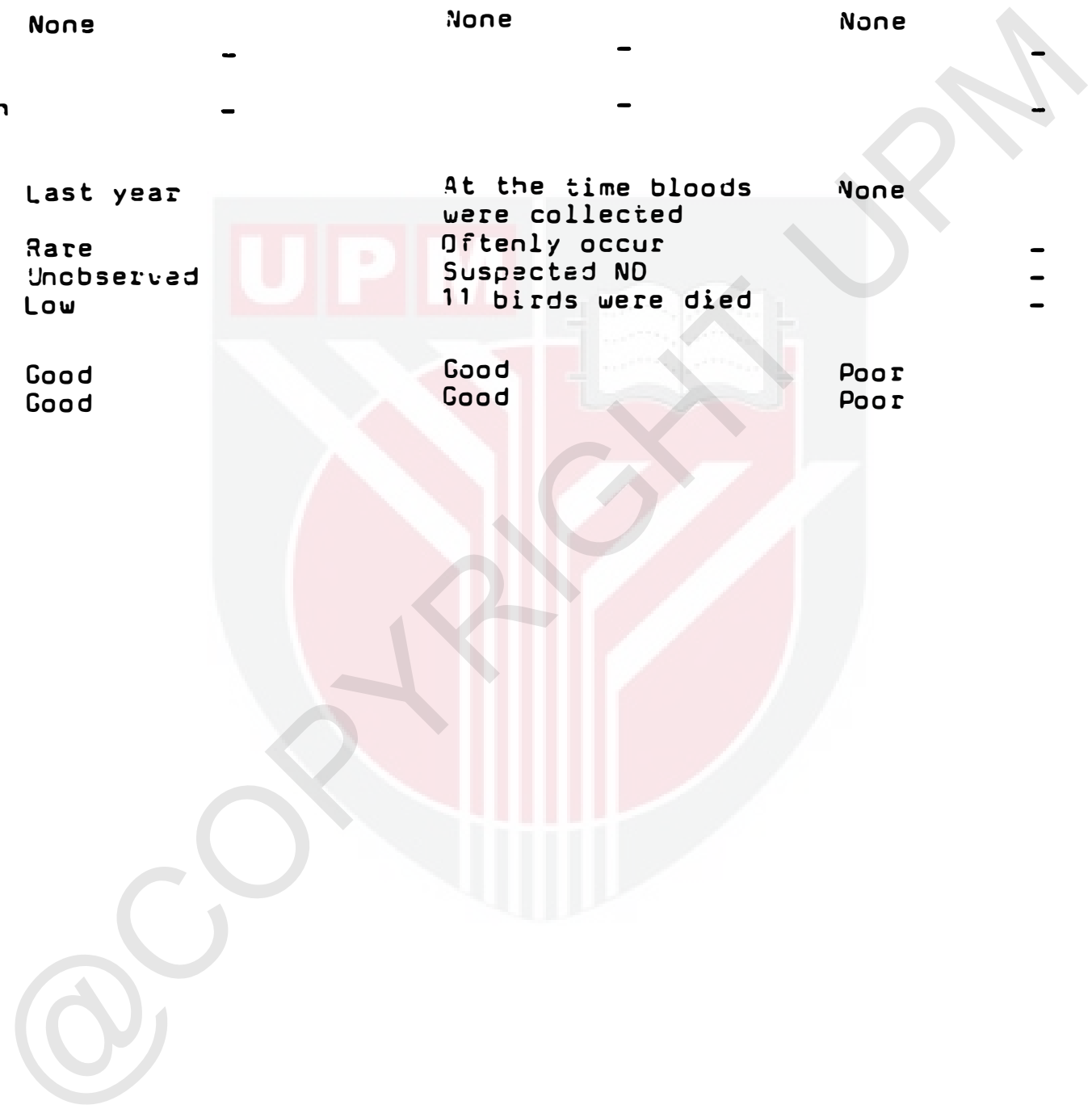
Poor

Good

Good

Poor

Poor



AREA: SUNGEI BESI

	FLOCK 1	FLOCK 2	FLOCK 3
I. GENERAL INFORMATION			
Owner:	Puan Jamilah	Puan Wan Kamaliah	Kopral Majid
Address:	No.17, Block A-4172, Sungei Besi Camp	No.9, Block A-4172, Sungei Besi Camp	A-24, Kg. Pinang, Sungei Besi Kuala Lumpur
Types of farming:	Backyard	Backyard	Backyard
Flock size:	8 birds	30 birds	40 birds
No. of samples:	4 samples	8 samples	22 samples
Age group:	1 month of age	2 adults and 1 old birds	20 adults and 2 young
Source of birds:	From relatives	From relatives	From relatives
Other poultry:	None	Ducks	Ducks
II. MANAGEMENT PRACTICES			
HOUSING:-			
Roof:	Zinc	Zinc	Zinc
wall:	Wood	Wood	Wood
Floor:	Split level flooring	Split level flooring	Raised flooring
EQUIPMENT PROVIDED:-			
Feeders:	Made from wood	Made from wood	Made from wood
Drinkers:	Unused dishes	Small size plastic type	Small size plastic type
Nest boxes for laying hens and day old chicks:	Yes	Yes	Yes
FEEDING:-			
Natural feed sources:	Yes	Yes	Yes
House-hold left over:	Yes	Yes	Yes
Grain/Concentrate/Others:	Concentrate for young birds	Maize	Concentrate and gandum
BROODER (if practices):-	Natural brooding	Natural brooding	Natural brooding
III. FLOCK HISTORY			
VACCINATION:-			
Vaccinated/not vaccinated	Not vaccinated	Vaccinated	Not vaccinated
Type of vaccination:		Ranikhet-F	
When it is vaccinated:		1983	
Vaccination service given by:		FKVSP, UPM	
PROPHYLACTIC MEDICATION:-			
Anti-stress/Deworming/ Insecticides/Coccidiostat /Antibiotic/Others:	None	None	None

DISSINFECTANT:-

Disinfectant used: None

Methods of disinfection: -

Frequency of shed cleaning and disinfection: -

PREVIOUS AND PRESENT DISEASE:-

When:

End 1983

How often:

Once a year

Observed clinical sign:

Suspected ND

Mortality:

100%

None

-

None

-

End 1983

Once a year

Confirmed ND

100%

1

End 1983

Once a year

Confirmed ND

90%

IV. REMARK AND EVALUATION

Management:

Satisfactory

Hygiene:

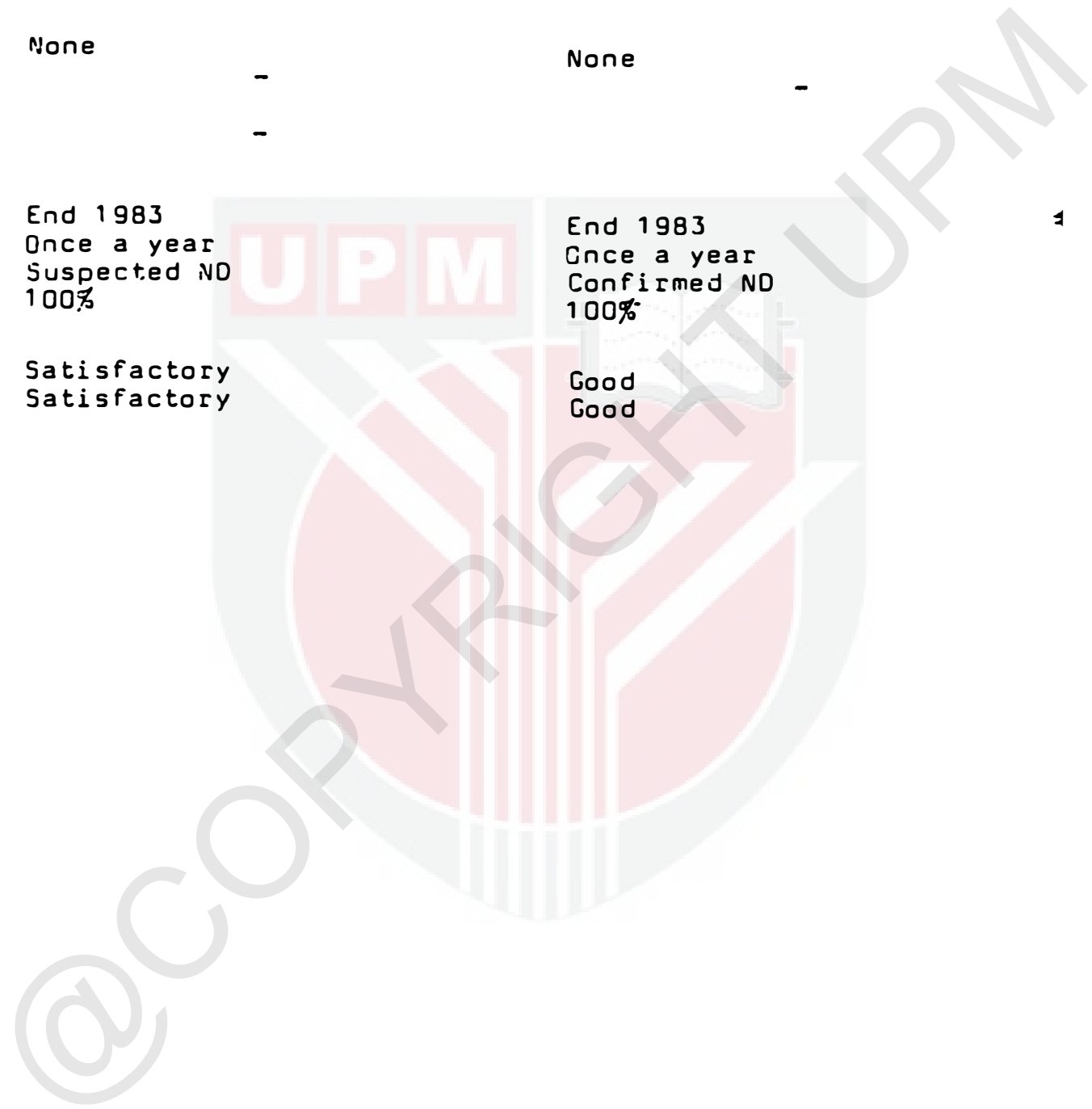
Satisfactory

Good

Good

Good

Good



AREA: SEPANG

	FLOCK 1	FLOCK 2	FLOCK 3	FLOCK 4	FLOCK 5	FLOCK 6
I. GENERAL INFORMATION						
Owner:	En. Jammaludin	Pn. Sabariah	En. Endik	En. Teen	En. Khatan	En. Cheen
Address:	Pekan Dengkil, Sepang	Pekan Dengkil, Sepang	Kg. Orang Asli Bukit Tampoi	Kg. Orang Asli Bukit Tampoi	Kg. Orang Asli Bukit Tampoi	Kg. Orang Asli Bukit Tampoi
Types of farming:	Bacyard	Backyard	Backyard	Backyard	Backyard	Backyard
Flock size:	15 birds	10 birds	10 birds	10 birds	10 birds	10 birds
No. of samples:	14 adults	7 adults	3 adults	4 adults	5 adults	4 adults
Age group:	14 adults	10 adults	Adults	Adults	Adults	Adults
Source of birds:	Relatives	Relatives	Unknown	Unknown	Unknown	Unknown
Other poultry:	Ducks	None	Ducks, Geese	None	None	None
II. MANAGEMENT PRACTICES						
HOUSING:-						
Roof:	Zinc	Zinc	No shed provided	No shed provided	No shed provided	No shed provided
Wall:	Wire-mesh	Wood	-	-	-	-
Floor:	Raised flooring	Raised flooring	-	-	-	-
EQUIPMENT PROVIDED:-						
Feeders:	Yes	Yes	None	None	None	None
Drinkers:	Yes	Yes	None	None	None	None
Nest boxes for laying and day old chicks	Yes	Yes	None	None	None	None
FEEDING:-						
House-hold left over:	Yes	Yes	Yes	Yes	Yes	Yes
Natural feed sources:	Yes	Yes	Yes	Yes	Yes	Yes
Grain/Concentrate/Others:	Wheat	Wheat	Maize	Maize	Tapioca, maize	Tapioca
BROODER (if practices):	Natural brooding	Natural brooding	Natural brooding	Natural brooding	Natural brooding	Natural brooding
III. FLOCK HISTORY						
VACCINATION:-						
Vaccinated/not vaccinate	Not vaccinated	Not vacci a ed	Not vaccinated	Not vaccinated	Not vaccinated	Not vaccinated
Type of vaccination:	-	-	-	-	-	-
When it is vaccinated:	-	-	-	-	-	-
Vaccination service given by:	-	-	-	-	-	-
PROPHYLACTIC MEDICATION:						
Anti-stress/Deworming/ Insecticides/Coccidiostat /Antibiotic/Others:	VISIN ^R against Coryza, Cocci- dia, pullorum	None	None	None	None	None

DISSINFECTION:-

Disinfectant used:

None

None

None

None

None

None

Method of disinfection

-

-

-

-

-

-

Frequency of shed

cleaning and disinfection

-

-

-

-

-

PREVIOUS AND PRESENT

DISEASE PROBLEM:-

When:

Mid-1983

Mid-1983

Mid-1983

Mid-1983

Mid-1983

Mid-1983

How often:

Rare

Rare

Quite often

Quite often

Quite often

Rare

Observed clinical signs:

Suspected NO

Suspected NO

Suspected NO

Suspected NO

Suspected NO

Suspected NO

Mortality:

High

High

High

High

High

High

IV. REMARK AND EVALUATION

Management:

Poor

Poor

Poor

Poor

Poor

Good

Hygiene:

Poor

Poor

Poor

Poor

Poor

Good

