

## ASSESSMENT OF FLOCK IMMUNITY AGAINST RANIKHET DISEASE\*

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### ABSTRACT

*A study was undertaken to assess the flock immunity against Ranikhet disease in five different commercial flocks. The level of maternal antibody in chicks of all the flocks was above protective level at the time of first vaccination. All the birds in the flocks responded to vaccination. The highest mean haemagglutination inhibition (HI) titre was 112.00. Clinical signs and mortality due to Ranikhet disease (RD) were not observed during entire period of study and the fluctuation in the immune response was due to varying vaccination schedule in conjugation with different managemental practices.*

**Key words:** Ranikhet disease, Flock immunity, Geometric Mean Titre, Maternal antibody and Haemagglutination Inhibition test

### INTRODUCTION

In India, Namakkal is having approximately 3.5 crores of layer population producing 2.8 crore eggs per day. Poultry industry is often experiencing frank outbreak of diseases leading to heavy mortality in layers. Some diseases cause severe economic losses through drop in production without showing clinical signs. Among which Ranikhet disease is most important because it causes drop in production in laying birds having low HI titre against it. The low HI titre may be due to the result of faulty vaccination schedules and improper managemental practices. Assessment of immune status at regular intervals would help the farmer to maintain high protective and productive titre in the laying birds and thus overcome the problem of disease outbreaks and drop in production.

### MATERIALS AND METHODS

Five commercial layer flocks in and around Namakkal were selected and designated from A to E. One per cent chicken red blood cells (CRBC) was prepared as per the procedure described Santhi (1998). Ranikhet disease virus antigen propagated from embryonated hen's eggs and hyper immune serum raised against it were used as reference materials. The vaccination schedule followed and vaccines used were presented in Table-1. For assessment of maternal antibodies (Mab), 30 representative sera were collected from chicks of each flock at the time of first vaccination. Monitoring of antibody titres against RD was carried out in the selected five flocks from 1 to 22 weeks. Thirty representative sera were collected from each flock every fourteen days post-vaccination and assessed for Ranikhet disease virus antibodies by HI test as per the procedure described by OIE (1992) with slight modification. All the birds

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under the study responded to vaccination as the vaccines used contained more than  $10^{6.0}$  EID<sub>50</sub> per dose.

### RESULTS AND DISCUSSION

The Mab mean titre and geometric mean titre (GMT) ranged between 46.90 to 57.60 and 42.20 to 48.50 respectively just before vaccination (Table-2). The Mab mean titre and GMT observed just at the time of vaccination indicated that all the birds had protective level of Mab. This is in accordance with the findings of Allan *et al.* (1978).

Post-vaccinal antibody titre in the birds of selected flocks assessed at every 14 days by HI test up to 22<sup>nd</sup> weeks are shown in Table -2. It was found that the chicks in the flocks responded to vaccination; similarity in the immune response to vaccine were noted up to 10<sup>th</sup> week except in flock-E, where mean HI titre was 112.00.

The highest HI titre was recorded in the flock-A (115.20) and continued to remain high during the entire period of study (upto 22 weeks) when compared to other four flocks from 14<sup>th</sup> week onwards. The lowest HI mean titre recorded was 34.10 and no mortality was observed in any of the flocks under the study which correlates with the findings of Allan *et al.* (1978) who reported zero per cent mortality on challenge, if HI titre was between 16-64.

The time of vaccination in the flocks fell within the range but the interval between primary

and booster between boosters varies to a great extent. Similar finding was noted during the poultry disease episode-1993 (TANUVAS Publications, 1995) which leads to the presence of varying degrees of flock immunity in the geographical area covered. This might be one among the reasons for the continuous presence and perpetuation of infection in the locality.

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**Table 1****Vaccination schedule followed against Ranikhet disease in selected flocks**

Flocks	1	4	5	8	9	10	18	19	20
A	RDV F	LaSota		RDV K			RDV K		
B	RDV F		LaSota			R2B			R2B
C	RDV F	LaSota				R2B			R2B
D	RDV F		LaSota			R2B			R2B
E	RDV F	LaSota		RDV K			RDV K		
TAC	RDV F/LaSota (7 <sup>th</sup> day)	LaSota (30-35 days)		-----RDV K-----			-----RDV K-----		

TAC- Technical Advisory Council recommendation (TANUVAS Publication, 1995)

**Table 2****Immune response against Flock immunity for Ranikhet disease in selected five commercial flocks**

Flocks	HI Titre	Age in weeks											
		1	2	4	6	8	10	12	14	16	18	20	22
A	Mean titre	54.90	40.00	44.80	60.80	69.30	39.50	81.07	115.20	102.40	96.00	104.50	113.10
	GMT	45.30	36.80	39.40	48.50	52.00	34.30	68.60	119.4	90.50	84.44	90.50	97.00
B	Mean titre	57.60	45.30	65.10	59.70	75.70	52.30	98.10	87.50	74.70	59.70	73.60	85.30
	GMT	48.50	39.40	55.70	52.00	64.00	48.50	90.50	78.80	64.00	52.00	64.00	78.80
C	Mean titre	54.40	42.10	62.90	74.70	85.30	73.60	108.80	98.10	85.30	66.10	71.50	86.40
	GMT	48.50	39.40	55.70	68.60	78.80	64.00	97.00	90.50	78.80	59.70	64.00	84.40
D	Mean titre	46.90	42.10	67.20	59.70	70.40	62.90	94.90	88.50	77.90	67.20	91.70	85.30
	GMT	42.20	39.40	59.70	55.70	64.00	52.00	84.40	78.80	68.60	59.70	84.40	78.80
E	Mean titre	57.10	34.10	45.30	84.30	77.90	112.00	90.70	82.10	74.70	50.10	83.20	75.70
	GMT	48.50	29.90	34.30	68.60	64.00	84.40	73.50	73.50	64.00	42.20	73.50	68.60