

## PERFORMANCE ECONOMICS OF BROILER REARING WITH REOVIRUS INFECTION

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### ABSTRACT

The broiler birds after experimental challenge with virulent MAS reovirus developed infection. This infection resulted into poor body weights, uneven growth, poor FCR, poor BPEI and poor PEI. The uninfected birds showed uniform live weights, even growth, better FCR, better BPEI and better PEI. The group with reovirus infection resulted into economic loss while uninfected group resulted into profit.

**Key words :** economics, broiler, reovirus, performance.

### INTRODUCTION

The avian reoviruses have emerged to induce various manifestations including malabsorption syndrome (MAS), femoral head necrosis, pericarditis, myocarditis, hydropericardium, gastroenteritis, hepatitis, and acute and chronic respiratory syndromes in chickens (Shivaprasad *et al.*, 2009). This infection is an important cause of suboptimum performance (Spackman *et al.*, 2010) and goes unnoticed in field due to masking of the symptoms by secondary infections and commonly observed nutritional disorders (Bhardwaj *et al.*, 2003) in broilers. In affected flock, especially at early ages, a small number of birds (1-5%) show severely stunted growth and a considerable proportion (10-50%) show variable growth rate in MAS. All the affected birds do not show the signs of illness but remain active and voracious feeders. The farms with such infection suffer from heavy economic loss due to higher culling rate, poor feed conversion ratio, reduced and variable body weights at the time of sale. The present study

was aimed to investigate the effect of reovirus infection on broiler economics.

### MATERIAL AND METHODS

All the necessary permissions from Institutional Bio-safety Committee and Institutional Animal Ethics Committee had been obtained to carry out the research work.

A total number of 200 straight-run, day old and healthy 'Vencobb' broiler chicks were obtained from M/s. Venkateshwara Hatcheries Ltd., Pune. They were equally divided into two groups (A and B) and eight replications (A<sub>1</sub>, A<sub>2</sub>, A<sub>3</sub>, A<sub>4</sub> and B<sub>1</sub>, B<sub>2</sub>, B<sub>3</sub>, B<sub>4</sub>). They were reared under deep litter system following standard and uniform managerial practices. The virulent reovirus (MAS strain) was obtained from M/s. Ventri Biologicals, Pune. The required medicines, feed and supplements were purchased from local market.

On day three, B group was challenged with 0.1 ml of 10<sup>4</sup> TCID<sub>50</sub> (per bird) MAS strain of reo

virus via intra-muscular route. The group A was kept as unchallenged control.

Growth Performance was recorded by computing mean live body weights (gm/bird) on day 3 and 28, Feed conversion ratio (FCR), Broiler performance efficiency index (BPEI) and Protein efficiency index (PEI) using standard formulae. The actual cost of rearing and sold out amount per group were recorded. The net profit and input : output ratio (IOR) was calculated. The data obtained on various parameters studies during these trials were subjected to statistical analysis following standard methods (Snedecor and Cochran, 1994).

## RESULTS AND DISCUSSION

The results obtained during the experiments are indicated in Table 1 and Table 2.

The results revealed no significant difference in live weights up to the age of 3 days while significant difference was observed between group A and group B at the end of experiments. The live weights were found to be significantly lower from the age of 15 days onward in chicks from group B after reo virus (MAS) infection when compared with control group A. The uneven growth rate and live weights were recorded in group B after infection. In control group A the growth was found to be uniform with increasing trend in body weight. However, the feed intake was approximately equal in both the groups. The poor FCR, BPEI and PEI were recorded in reovirus infected chicks as compared to the chicks from control group.

The results of present study revealed profit of Rs. 11.64 per bird in healthy uninfected birds (group A) on 28<sup>th</sup> day of age whereas loss of Rs.

9.78 per bird was recorded in reovirus infected birds (group B). The IOR in group A indicated the receipt of Rs. 1.18 per rupee invested. The receipt of Rs. 0.85 per rupee invested was recorded in group B. The IOR values in group A indicated that the healthy birds competed efficiently during the rearing period. However, more investment and larger flock size may boost the overall profitability. This indicates to have larger commercial broiler units to run the business in higher profits. Othman *et al.* (2000) and Hameed *et al.* (2003) also reported that the size of flock needs to enlarge to improve economic efficiency of broiler farming. The reduced IOR values in group B suggested inefficient utilization of the resources by the birds. This inefficiency may be associated with the digestive disturbances caused by avian reovirus.

During the present investigation, all birds inoculated with reovirus (group B) were developed the disease. It indicated that the birds are most susceptible to avian reovirus infection at young age (Goldenberg *et al.*, 2011). The reovirus infection is suggestive of suppressive factors (Neelima *et al.*, 2003). Investigators documented anemia, variable live weights and poor performance that had reportedly occurred in several successive grow-out flocks of commercial broilers due to this infection (Prameela Rani *et al.*, 2011) resulting into economic losses.

The GI tract has the most extensive exposed surface in the body, to infections and a wide variety of factors associated with diet. Infectious disease agents like reovirus can negatively affect the delicate balance among the components of the chicken gut. Such infections may disturb this balance which may result into poor health status

**Table 1. Growth performance of broilers**

Group	No. of birds	Body weight (gm/bird)		FCR	BPEI	PEI
		Day 3	Day 28			
A	25 X 4	118.2 ± 0.70	1156 <sup>a</sup> ± 14.08	1.68 <sup>b</sup> ± 0.03	110.12 <sup>a</sup> ± 0.83	0.32 <sup>b</sup> ± 0.02
B	25 X 4	118.2 ± 0.49	811 <sup>b</sup> ± 19.58	2.44 <sup>a</sup> ± 0.08	45.09 <sup>b</sup> ± 1.79	0.47 <sup>a</sup> ± 0.16

NS – Non significant, <sup>a</sup> and <sup>b</sup> – Significant at P < 0.05

**Table 2. Economics of broiler rearing**

Expenditure			Income		
Particulars	Amount		Particulars	Amount	
	Group A	Group B		Group A	Group B
Chicks @ Rs. 17.00/Chick	1700.00	1700.00	Sale of Birds @ Rs. 60.00/Kg	6936.00	4866.00 (Disposed)
Feed Starter @ Rs. 18.50/Kg	1388.00	1388.00	Litter sale	500.00	500.00 (Disposed)
Feed Finisher @ Rs. 18.00/Kg	2124.00	2196.00	Gunny Bags	240.00	240.00
Vaccines and Medicine	200.00	200.00	Bulbs	100.00	100.00
Litter Material	200.00	200.00			
Light, Water and other	1000.00	1000.00			
<b>Total (Rs.)</b>	<b>6612.00</b>	<b>6684.00</b>	<b>Total</b>	<b>7776.00</b>	<b>5706.00</b>
Profit/Loss					
Particulars	Group A		Group B		
Income (Rs.)	7776.00		5706.00		
Expenditure (Rs.)	6612.00		6684.00		
Net Profit (Rs.)	+ 1164.00		- 978.00		
<b>Input : Output Ratio</b>	<b>1.18</b>		<b>0.85</b>		

and production performance of broiler birds (Yegani and Korver, 2008 and Awandkar *et al.*, 2012). The findings of present investigations indicated altered absorption of nutrients from gut due to reovirus infection and resulted into poor and uneven growth, poor feed conversion, lowered body weight and increased condemnation.

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