



# IMPACT OF DIFFERENT LITTER MATERIALS ON THE PRODUCTION PERFORMANCE OF COMMERCIAL BROILER

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## ABSTRACT

A biological experiment was conducted to determine the impact of four litter materials (saw dust, coir waste, ground nut hulls and rice husks) on the production performance of broiler chicken in deep litter system. The experiment was conducted by using one hundred and sixty six separated, day old commercial broiler chicks. The chicks were weighed, wing banded and randomly allotted into four treatment groups with four replicates of ten chicks per replicate totalling forty per treatment. The standard diets were fed to broiler chicken for forty-two days under standard management conditions in deep litter system and production performance like weekly body weight and feed consumption were recorded at weekly interval and mortality was recorded at occurrence. From the above data feed conversion ratio, body weight gains and livability were calculated. At the end of the experimental period, two birds from each replicate (one male and female) were randomly selected for slaughter to study the carcass characteristics.

The results of the experiment revealed that different litter materials had significantly ( $P < 0.05$ ) influenced the body weight, body weight gain, feed consumption, feed conversion ratio and carcass characteristics in broiler chicken. However, the group T<sub>1</sub> (rice husk) achieved higher body weight (2310g) and body weight gain (2290 g) and better feed conversion ratio (1.68) than rest of the treatment groups. The group T<sub>1</sub> (rice husk) recorded higher eviscerated yield (66.68%) and the net profit was also highest in group T<sub>1</sub> (Rs.12.14/bird) (rice husk) and hence it is recommended that rice husk can be used as litter material for commercial broilers in deep litter system of management.

Key words : Litter materials, broilers, feed, feed conversion ratio, body weight.

## INTRODUCTION

Poultry industry in recent years occupied a leading position among agricultural industries in many parts of the world. Poultry meat and eggs serve as an important source of high quality animal protein in areas of the world having protein insufficiency.

In India, broilers are mostly reared in deep litter system with litter materials. Litter material is any dry material used on the floor of chicken houses on which chicken dropping will fall. It is known as litter material because, it combines with the droppings and undergoes a bacterial breakdown process, thus preventing an odour and unsanitary condition (Demiruluset *al*, 2006).

Use of litter material depends on their availability, price and comfort of the birds. Few available reports on the effect of litter on the production performance of birds in the form of body weight gain are contradictory and showed a need for validation.

Hence, this project work is taken to study the influence of different litter materials on the production performance of commercial broiler chicken.

## MATERIALS AND METHODS

A biological experiment was conducted to optimise the influence of different litter materials on the production

performance of commercial broiler chicken reared in deep litter system.

### Location

The biological experiment was designed and conducted during June and July 2017 in broiler farm located at the Poultry Farm, Department of Poultry Science, Lal Bahadur College, Warangal, Telangana State.

### Biological experiment

#### Period of study

The experiment was conducted for six weeks' period during June and July 2017. The whole experiment period was divided into two phases viz. starter (1 to 21 days) and finisher phase (22 to 42 days).

#### Experimental birds

One hundred and sixty broiler chicks obtained from hatchery unit maintained at poultry farm, Department of Poultry Science, Lal Bahadur College, Warangal, were utilised for the biological experiment.

#### Experimental design

The biological experiment was carried out with one hundred and sixty, day old broiler chicks reared under standard management practices by using different litter materials in the deep litter system. The chicks were weighed, wing banded and randomly assigned to four treatment groups with four replicates of 10 chicks each. Four

experimental litter materials were used for broiler chicken throughout the study period.

Treatment	Particulars	No. of replicates	No. of birds per replicate	Total birds per treatment
1	Saw dust	4	10	40
2	Coir waste	4	10	40
3	Ground nut hulls	4	10	40
4	Rice husk	4	10	40
			<b>Total</b>	<b>160</b>

### Housing system

All the chicks were reared up to 6 weeks of age in deep litter system with the different litter materials with uniform feeders and waterers space as per the requirement and reared under standard management conditions throughout the experimental period.

In deep litter system, the brooding temperature was maintained at 35°C during the first five days and gradually decreased by 0.5°C every day until the environmental temperature is reached.

### Collection of data

Throughout the study period of 6 weeks, data on body weight and feed consumption were recorded at weekly interval and mortality was recorded at occurrence. From the above data, weekly body weight gain was calculated.

## RESULTS AND DISCUSSION

The results obtained from this study with respect to the production performance of broiler chicken reared in deep litter system as influenced by

different litter materials are presented and discussed with available literatures.

### Production performance

#### Body weight and body weight gain

The mean ( $\pm$  S.E.) body weight (g) and body weight gain (g) of Broiler chicken reared in deep litter system from 1 to 6 weeks of age as influenced by different litter materials are presented in Table 1 to 2, respectively and graphical representation of data is depicted in figure 1 and 2 respectively.

The analysis of variance of data revealed significant difference on mean body weight of broiler chicken reared with different litter materials throughout the study period. At the end of sixth week, the group T<sub>4</sub> (Rice husk) recorded significantly higher body weight (2290g to 2310g) than the rest of the treatment groups (2170g to 2190g).

The results of the study indicate that broiler chicks reared in deep litter system on rice husk showed significantly higher body weight and body weight gain.

The above results are in accordance with the earlier reports of Billgillet *al*(1999), shanmughasundaramet.*al*(1977), Sharma(1987), Moniraet.*al* (2003), skrbicet.*al* (2012), Bjedoret.*al* (2013), Karamanis (2008) and Garcia *et.al* (2010), Bilgilli and Garcia *et.al*(2010) Villagraet.*al* (2011) reported that Broiler chicken reared in deep litter

system with different litter materials influenced the body weight and body weight gain.

The result of above study revealed in broiler chicken the T4 (rice husk) achieved higher body weight and body weight gain which may be due to more comfort to the broiler chicken.

**Table 1.**

**Mean ( $\pm$  S.E.) body weight (g) of broiler chicken from day old to 6 weeks of age as influenced by different litter materials.**

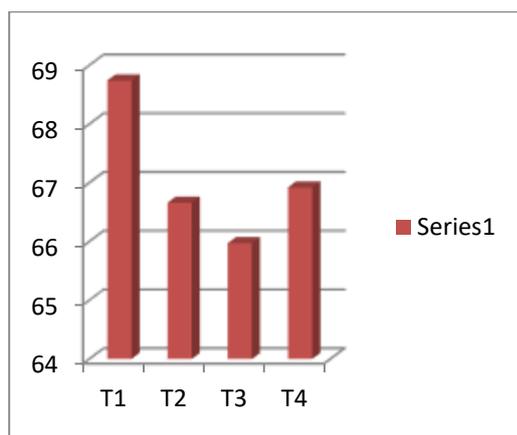
Treatment	I week	II week	III week	IV week	V week	VI week
T1	168 $\pm$ 10	380 $\pm$ 16	820 $\pm$ 40	1310 $\pm$ 54	1740 $\pm$ 66	2310 $\pm$ 80
T2	166 $\pm$ 08	376 $\pm$ 14	810 $\pm$ 36	1300 $\pm$ 48	1710 $\pm$ 58	2190 $\pm$ 78
T3	164 $\pm$ 06	372 $\pm$ 10	790 $\pm$ 20	1280 $\pm$ 42	1700 $\pm$ 54	2176 $\pm$ 70
T4	168 $\pm$ 10	380 $\pm$ 16	820 $\pm$ 40	1310 $\pm$ 54	1740 $\pm$ 66	2210 $\pm$ 80

**Table 2**

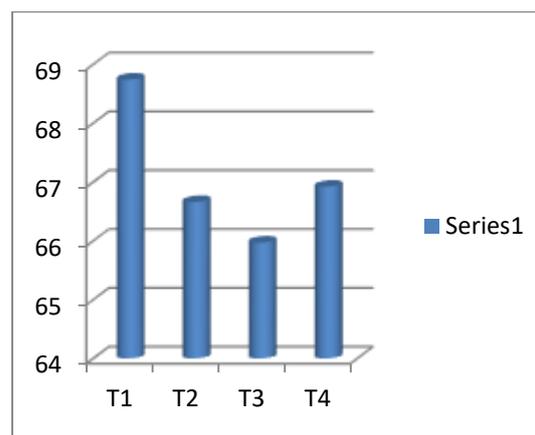
**Mean ( $\pm$  S.E.) body weight gain (g) of broiler chicken from day 1 to 6 weeks of age as influenced by different litter materials.**

Treatment	I week	II week	III week	IV week	V week	VI week
T1	128 $\pm$ 10	340 $\pm$ 16	780 $\pm$ 40	1270 $\pm$ 54	1600 $\pm$ 66	2290 $\pm$ 80
T2	126 $\pm$ 08	336 $\pm$ 14	770 $\pm$ 36	1260 $\pm$ 48	1670 $\pm$ 58	2150 $\pm$ 76
T3	124 $\pm$ 06	330 $\pm$ 10	740 $\pm$ 20	1240 $\pm$ 42	1660 $\pm$ 54	2136 $\pm$ 70
T4	120 $\pm$ 10	320 $\pm$ 08	736 $\pm$ 16	1290 $\pm$ 36	1610 $\pm$ 66	2124 $\pm$ 68

**FIGURE – 1. Mean body weight (g) of broiler chicken at 6 weeks of age as influenced by different litter materials**



**FIGURE – 2. Mean body weight gain (g) of broiler chicken at 6 weeks of age as influenced by different litter materials**



## CONCLUSION

A biological experiment was conducted to determine the impact of four litter materials (rice husk, coir waste, groundnut hulls and saw dust) on the production performance of broiler chicks in deep litter system. The experiment was conducted by using one hundred and sixty six separated day old commercial broiler chicks. They chicks were weighed wing banded and randomly assigned into four treatment groups with four replicates of ten chicks each. All chicks were reared under standard management practices up to six weeks of age.

During the experimental period production performance like body weight and feed consumption were recorded at weekly interval and mortality was recorded at occurrence and from the above data body weight gain were calculated. At the end of the experimental period (42<sup>nd</sup> day), two birds from each replicate totalling eight birds per treatment were randomly selected and slaughtered. In the biological trail, by different litter materials to broiler chicken in deep litter system, the group T1 (rice husk) recorded significantly ( $P<0.05$ ) higher than mean body weight (2310g) and body

weight gain (2290g) compared to other treatment groups at six weeks of age.

In broiler chicken, the group T3 (saw dust) recorded significantly ( $P<0.05$ ) lower cumulative feed consumption (3.4kg) at six weeks of age compared to rest of the treatment groups.

In broiler chicken, showed significant ( $P<0.05$ ) difference in Gizzard, Giblet, Liver and abdominal fat yields by different litter materials six week of age. The group T1 (rice husk) recorded higher eviscerated and group T2 showed higher giblet yield.

In broiler chicken, different litter materials showed no significant ( $P<0.05$ ) influence on the abdominal fat yield and maximum abdominal fat yield was noticed in group T4 (saw dust).

In broiler chicken T1 (rice husk) group recorded higher production cost per bird and group T4 (saw dust) recorded lowest cost of production and higher net profit per bird.

**From this trial, it may be concluded that:**

1. Different litter materials had significant influence on the body weight, body weight gain in broiler chicken.
2. Different litter materials to broiler chicken had no significant influence on the livability during the study period.
3. Rice husk in deep litter system resulted higher fat yield in broiler chicken
4. Broiler chicken reared on different litter materials revealed that the net profit per bird was highest in group T1 (Rs.12.14 per bird) (rice husk).

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