

# Feasibility of using fallen tea leaves as litter in broiler rearing

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## Abstract

One hundred eighty straight run day old Cobb-500 broilers were reared on rice husk, sawdust, wood shaving and chopped tea leaves litter up to 35 days of age. The broilers were fed *ad libitum*. At 35 days the body weight of chicken reared on sawdust attained the highest body weight ( $p < 0.01$ ) than other litters. FCR was the best on saw dust. The moisture content of different litters did not differ significantly. Oocyst population in rice husk was found to be higher ( $p < 0.01$ ) than those on other litters, except those reared on wood shaving. Moisture content of litters and oocyst population were positively correlated at 14 and 35 days and negatively correlated at 21 and 28 days of age. The litter cost per broiler and per kg broiler was the highest on rice husk (RH), intermediate on sawdust (SD), Wood shavings (WS) and the lowest on chopped fallen tea leaves (CFTL). It was concluded that it may be possible to minimize the cost of litter by using CFTL.

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**Key words:** Broiler, litter, tea leaves, litter cost, oocyst.

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## Introduction

For successful broiler production, litter plays a vital role. Litter absorb moisture of droppings, keep floor dry and provide insulation under foot and give birds a suitable medium on which feeding, watering and other management are performed. The requisites of good litters are availability, price, moisture absorption, particle size, cleanliness, smoothness and free from moulds and comfort ability. Usual litter materials used worldwide are chopped rice straw, rice husk (RH), sawdust(SD), sugarcane pulp, oat hulls, corncobs, grinded corncobs, paper mill by-products, wood shaving, sand, ash, peat moss, keshari hulls and peanut hulls (Ghany et al. (1977), Jull (1979), Ranade and Rajmane (1990).

In Bangladesh, RH and sawdust (SD) are the most commonly used litter for rearing broilers. There are some cheaper unconventional litters; wheat straw, chopped straw, sand and paper mill by products. Substitution of conventional litter by cheaper unconventional one must be based on research evidences. In tea producing areas of Bangladesh, huge fallen tea leaves are available. The effects of using chopped fallen tea leaves (CFTL) as a litter material for broilers have not yet been assessed. The present study was undertaken to evaluate the effect of CFTL on the performance and economic feasibility of using tea leaves as a litter material in rearing broilers.

## Materials and methods

A total of 180 day old Cobb 500 straight run broilers were randomly distributed to 4 litter treatments; RH, SD, WS and CFTL at a depth of 5 cm having 3 replications each. The CFTL were collected from the tea garden and dried on the sun. The CFTL were chopped by chopping machine and used as litter material. The broilers were fed *ad libitum* on 2 standard diets; broiler starter (0-21 days), broiler grower and broiler finisher (28 - 35 days) diets. The broilers were exposed to a continuous lighting of 23 hours and dark period of 1 hour during 24 hour of the day. Each broiler was given a floor space of 1000 cm<sup>2</sup>. Brooding temperature started at 34°C and reduced @ 2.5°C per week until 21°C.

Representative litter samples were collected from 4 corners and central position of each pen weekly and mixed thoroughly for making composite samples. Half of the mixed samples were used for the determination of moisture content and the remaining half was processed to determine coccidial oocyst population. The coccidial oocysts were determined every week. Moisture content of every representative sample was determined in duplicate at 105° C until constant weight was recorded. The samples were stored in a refrigerator before examination. The number of oocyst per gram of litter was counted by following the method reported by Karim et al. (1994) with slight modification. 10g litter samples were

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soaked in 100 ml of water for 24 hours. It was mixed thoroughly by vigorous shaking in a screw-capped bottle and subsequently sieved through a tea strainer to remove the coarse particles. After centrifugation (at 1100 RPM for 5 minutes) the supernatant was discarded and the sediment was resuspended in 100 ml of saturated salt solution. Two chambers of a Mc Master counting slide were filled with the suspension with the help of a pipette and allowed 3 to 5 minutes for floatation. The number of oocyst was counted by a tally counter using a 6x eyepiece and 10x objectives of a compound microscope. The body weight (initial and weekly), feed consumption and mortality were recorded. Body weight gain and feed conversion ratio were calculated for each replication. Temperature, humidity and moisture contents and the Oocyst population were counted per replication.

The collected and calculated data were subjected to analysis of variance in a Completely Randomized Design using SAS computer packaged program. Significant differences were identified by Duncan's Multiple Range Test.

### Results and discussion

The highest body weight ( $p < 0.01$ ) of broilers (Table 1) attained on SD litter in comparison with other litters at all ages the results are with the observation of Hussain et al. (1996). They did not find any differences of body weight among different litter materials. It was revealed that 14 and 21 days feed consumption was almost similar on all litters, while differ significantly at 28 to 35 days among the litters.

It is evident that (Table 1) feed conversion ratio (FCR) was the poorest on WS, while RH and CFTL comparable FCR. The results are not consistent with the observation of Hussain et al. (1996) who did not find any difference in FCR of broilers which reared on SD, dried common grass (CG) and 1:1 mixture of SD and CG.

The litter cost per broiler and per kg broiler (Table 2) was the highest on RH, intermediate on SD, WS and the lowest on CFTL. No bird was died on any litter. The results agree with the findings of Haque and Chowdhury (1994) and Podder (1996).

The initial moisture contents of fresh RH, WS, SD and CFTL were 10.39, 14.46 10.64 and 13.48% respectively. At the end of the experiment, respective moisture contents were increased ( $p < 0.05$ ) to 20.35, 20.47, 19.42 and 21.76% (Table 3). Differences of moisture from initial to final were 9.96%, 6.01%, 8.78% and 10.28% respectively. The study revealed that CFTL appeared to have the highest moisture absorbing capability followed by RH, SD and WS ( $p < 0.05$ ).

No visual evidence of either leg abnormalities or breast blister in any bird was observed in any litter. The results agree with the findings of Haque and Chowdhury (1994) and Podder, (1996). They did not find any abnormalities on RH and SD.

Oocyst population detected in all samples collected at 14<sup>th</sup> day was small (Table 4). It was gradually increased and reached to a peak at 28<sup>th</sup> day and then declined in all litters (Table 4.). At 28<sup>th</sup> day, RH contained higher ( $p < 0.01$ ) oocyst than that of other litters.

**Table 1.** Effect of Rice husk (RH), Wood shaving (WS), Saw dust (SD) and Chopped Fallen Tea Leaves (CFTL) litters on the performance of broiler at different ages

Variable	Age(day)	Litter				Significance
		RH	WS	SD	CFTL	
Live weight (g/broiler)	7	166.22	165.67	167.56	164.22	NS
	14	437.23	423.34	423.67	423.89	NS
	21	807.78 <sup>a</sup>	775.56 <sup>bc</sup>	810.00 <sup>a</sup>	784.89 <sup>b</sup>	**
	28	1234.45 <sup>b</sup>	1144.11 <sup>d</sup>	1266.89 <sup>a</sup>	1198.98 <sup>c</sup>	**
	35	1717.26 <sup>b</sup>	1563.89 <sup>d</sup>	1745.01 <sup>a</sup>	1634.49 <sup>c</sup>	**
Feed intake (g/broiler)	14	705.73 <sup>a</sup>	692.62	660.62 <sup>b</sup>	693.18 <sup>ab</sup>	*
	21	1278.42	1278.42	1269.71	1287.51	NS
	28	2031.40 <sup>ab</sup>	2052.40 <sup>ab</sup>	1932.49 <sup>c</sup>	1983.51 <sup>b</sup>	**
	35	2741.80 <sup>ab</sup>	2640.18 <sup>ab</sup>	2648.29 <sup>ab</sup>	2626.62 <sup>b</sup>	**
Feed conversion ratio	14	1.62 <sup>b</sup>	1.64 <sup>a</sup>	1.56 <sup>c</sup>	1.64 <sup>a</sup>	*
	21	1.59 <sup>b</sup>	1.67 <sup>a</sup>	1.57 <sup>b</sup>	1.64 <sup>a</sup>	**
	28	1.65 <sup>b</sup>	1.79 <sup>a</sup>	1.53 <sup>c</sup>	1.66 <sup>b</sup>	**
	35	1.60 <sup>b</sup>	1.69 <sup>a</sup>	1.52 <sup>c</sup>	1.61 <sup>b</sup>	**

Values with different superscript(s) in same row differed significantly; NS, non-significant; \*,  $p < 0.05$ ; \*\*,  $p < 0.01$

## Fallen tea leaves as litter in broiler

**Table 2.** Cost of different litters on broiler production

Litter	Cost/kg fresh litter (Tk)	Litter Cost/ broiler (Tk)	Litter Cost/ kg weight gain (Tk)
RH	5.15	5.50	3.21
WS	4.85	1.46	0.94
SD	1.30	1.45	0.84
CFTL	2.5	1.1	0.67

**Table 3.** Moisture contents of different litters at the initial and of 35<sup>th</sup> day

Age (day)	Rice husk	Wood shaving	Saw dust	Tea leaves
Initial	10.39 <sup>c</sup>	14.46 <sup>a</sup>	10.64 <sup>c</sup>	13.78 <sup>b</sup>
35	20.35 <sup>b</sup>	20.47 <sup>b</sup>	19.42 <sup>c</sup>	21.36 <sup>a</sup>

Values in same row bearing different superscripts differed significantly ( $p < 0.05$ )

**Table 4.** Coccidial oocyst population  $\times 10^3$  in different treatment groups

Age (day)	Rice husk	Wood shaving	Saw dust	Tea leaves
14	1.82	1.39	1.02	1.66
21	1.82	1.95	1.16	1.70
28	2.00 <sup>a</sup>	1.95 <sup>b</sup>	1.33 <sup>d</sup>	1.74 <sup>c</sup>
35	1.82	1.52	1.14	1.71

Values in same row bearing different superscripts differed significantly ( $p < 0.01$ )

**Table 5.** Correlation between moisture content and coccidial oocyst population at different rearing periods

Age (day)	r-value	Significance level
14	+0.012	NS
21	-0.541	*
28	-0.710	**
35	+0.073	NS

NS, non-significant; \*,  $p < 0.05$ ; \*\*,  $p < 0.01$

The correlations of moisture with coccidiosis are shown in Table 5. The number of oocysts increased with the increase of moisture in litter at 14<sup>th</sup> and 35<sup>th</sup> day, but at 21 and 28<sup>th</sup> day, the number of oocysts had a tendency of negative relations with litter moisture. These pattern of positive and negative correlations of moisture with the number of oocysts ( $P > 0.05$ ) signify that the number of oocysts population in litter may

not follow in definite age related response. Correlations between moisture and oocyst population did not differ significantly among the treatment groups ( $P > 0.05$ ).

It can be concluded from the study that different types of litter materials had no effect on moisture content and survivability, but body weight on sawdust was significantly higher than other treatment groups. Tea leaves absorbed higher amount of moisture (21.36%) in comparison with others litter materials at 35 days of age. Broilers were not be affected by breast blister or leg abnormalities if reared on rice husk, sawdust, wood shaving and tea leaves litter. Oocyst population was increased in birds reared on rice husk while the cost of tea leaves was the lowest.

## References

- Ghany K, Kossar K and Machalie E (1977). The effects of different types of litter on body weights, feed efficiency and viability of chicks, Poultry Abstracts, 3: 57-58.
- Haque MI and Chowdhury SD (1994). Use of rice husk litter at different depths for broiler chicks during summer. British Poultry Science, 35: 809-812.
- Hussain SA, Zahid S and K (1996). Effect of different types of litter materials on the performance of broilers. Pakistan Journal of Zoology, 28: 181-182.
- Jull MA (1979). Kinds of litter. Poultry Husbandry. Tata McGraw Hill Publishing Company Limited. New Delhi- 110020.
- Karim MJ, Begum N and Khan MSR (1994). Prevalence of coccidiosis in broiler on two farms in Bangladesh. Pakistan Journal of Scientific and Industrial Research, 37: 339-341.
- Podder CK (1996). Performance of broiler chicks reared on sawdust litter at different depths. Master of Science in Poultry Science, Thesis, Dept. of Poultry Science, Bang. Agril. Univ., Mymensingh.
- Ranade AS and Rajmane BV (1990). Comparative study of different litter materials for poultry. Poultry Adviser, 13: 21-26.