

RESEARCH PAPER

Effect of age and sex on litter moisture level in deep litter rearing of Vanaraja chickens

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Article Info : Received : 03.08.2016; Revised : 26.08.2016; Accepted : 13.09.2016

The objective of this study was to evaluate the effect of age and sex on moisture level of litter material in Vanaraja chicken for nine weeks. One hundred fifty Vanaraja chicks (75 male+75 female) were used for experiment. Litter moisture levels were measure at an interval of 3 weeks. Litter from male group had a significantly ($p<0.05$) higher moisture per cent than that of other two groups. Similar trend was also observed at 42 days of age. Moisture level between all three groups varied significantly ($p<0.05$). But at 63 days of age continued trend changes and litter materials from female group had a significantly ($p<0.05$) higher moisture per cent than that of other two groups. Litter moisture per cent is a good indicator of antibacterial property of litter materials so it should be monitored regularly and should be changed at a regular interval.

Key words : Litter, Moisture, Age, Sex, Coccidia, Vanaraja

How to cite this paper : Panigrahy, Kuldeep Kumar, Behera, Kumaresh, Panda, Sasmita and Gupta, Shailesh Kumar (2016). Effect of age and sex on litter moisture level in deep litter rearing of Vanaraja chickens. *Asian J. Bio. Sci.*, **11** (2) : 289-291. DOI : 10.15740/HAS/AJBS/11.2/289-291.

INTRODUCTION

Broilers are generally reared on littered floor. The purpose of using litter on floor is to absorb moisture from birds, dropping to keep floor reasonably dry and to ensure comfortable condition for birds. It also gives birds a suitable medium on which feeding, watering and other management practices are carried out. Moisture is the key factor influencing litter quality in broiler houses. The higher the moisture level, the longer bacteria are able to survive in the litter. For example, in dry litter, bacteria may survive only a few hours or days, while in wet litter, survival may extend up to several weeks. Therefore, it is important to establish proper management strategies in order to properly control litter moisture. Maintaining an

optimum flock environment starts with having quality litter conditions. Keeping litter dry is a critical part of overall management on every poultry farm. Litter conditions influence bird performance, which in turn affects profits of growers and integrators. Dry litter helps control ammonia levels, provides a healthy flock environment, and reduces condemnations due to hock and footpad burns and breast blisters. Ideal litter has a 20 to 30 moisture level and less than 20 parts per million ammonia level (Watkins, 2001).

RESEARCH METHODOLOGY

One hundred fifty day-old sexed backyard chicken Vanaraja chicks (75 male + 75 female) were selected as

experimental birds. The experimental birds were randomly divided in to three groups.

- T₁ F: Female Vanaraja – 50 birds
- T₂ M: Male Vanaraja - 50 birds
- T₃ M+F: (Male + Female) Vanaraja - 25 each = 50 birds

The experiment continued for 9 weeks. The birds were reared in deep litter system of management. Litter material includes rice husk and lime as an anti caking agent (Shakila and Naidu, 1998).

Litter moisture estimation procedure :

In general terms, the weight of specific litter materials comes from either the moisture in the feed or from the dry matter (DM) portion. Dry matter refers to material remaining after removal of water, and the moisture content reflects the amount of water present in the litter. To accurately determine the DM of a litter, the sample collected must be representative of the feed. The sample size needed to determine DM is dependent on the drying equipment that will be used, and can range from around 100 to 500 g (approximately ¼ to 1 lb). An accurate scale that reads in grams or tenths of an ounce is important to insure accuracy in the calculations.

Forced air oven :

The most common means used to dry litter materials in a laboratory is with a forced-air oven. However, forced air ovens are usually quite expensive compared to other drying equipment, and have greater drying times. Drying time for silage samples is 24 to 48 hours.

Use the following steps to calculate the dry matter of a litter on farm (Pitt,1993).

- Weigh the empty container selected to hold the litter and record the weight.
- Place the litter in the container.
- Weigh and record the container and litter weight.
- Subtract the weight of the container from the total weight (Step 3) to determine the weight of the litter before drying.
- Thoroughly dry the litter.

-Weigh and record the container and litter weight immediately after drying.

-Subtract the weight of the container from the total weight (Step 6) to determine the weight of the litter after drying.

-Divide the weight of the dry litter (Step 4) by the weight of the wet litter (Step 7).

-Multiply by 100 to get a percentage.

- Subtract DM per cent from 100 to get the moisture percentage in the litter.

RESEARCH FINDINGS AND ANALYSIS

Moisture percentage of fresh litter was estimated as 9.18 per cent. it indicates that the fresh litter has correct DM per cent as recommended (Rao, 1986). Fresh litter was also devoid of any worms or coccidial agent as it was properly sundried. At 21 days moisture level in 3 groups were 15.93 per cent, 16.83 per cent and 16.11 per cent (Table 1). So it indicates moisture level rises according to advance in ages due to increase in feed intake which proportionately increases amount of faeces voided. In T₂ group moisture level was highest where as in females (T₁) it was lowest which varies significantly between these two groups (P<0.05). T₃ group comes intermediary to above two groups (Fig. 1). This may be due to higher bodyweight, BMR and higher

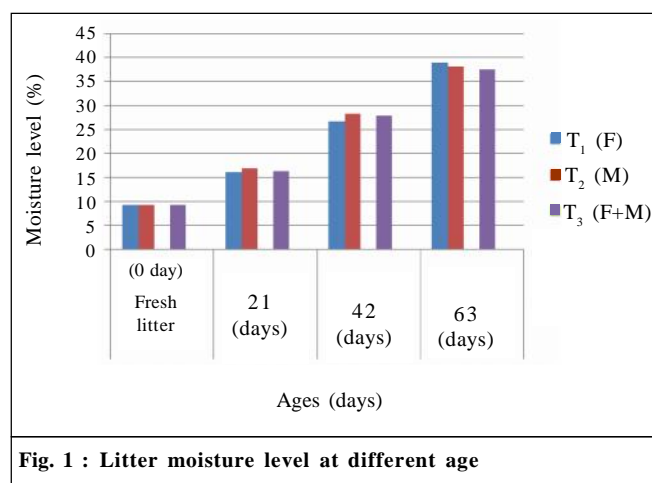


Fig. 1 : Litter moisture level at different age

	Fresh litter (0 day)	21 days	42 days	63 days
T ₁ (F)	9.18	15.93 ^a	26.52 ^c	38.81 ^b
T ₂ (M)	9.18	16.83 ^b	28.16 ^d	37.99 ^a
T ₃ (F+M)	9.18	16.11 ^a	27.81 ^e	37.33 ^a

Values bearing different superscripts within a column in a single age differed significantly (p<0.05)

amount of excreta in males than that of females. This result is similar to previous observations (Babu *et al.*, 1993). Litter sample analysis shown no oocyst and no fowl odours in the shed. So this level of moisture is not harmful.

At 42 days it was 26.52 per cent, 28.52 per cent, 27.81 per cent which is in similar trends to that of at 21 days. This level of moisture directly correlated with the higher body weight of males than that of females and there is a significant ($p < 0.05$) variation in the moisture level in all the three groups. These levels of moisture in all three groups were slightly higher than that of the recommended moisture level. Interestingly litter also emitted slight ammonical odour and litter sample analysis shown small number of coccidial oocyst at this moisture level. This agrees to the findings of previous workers (Carlile, 1984). So litter upto this level is not recommended and should be changed before this age.

At 63 days moisture level was 38.81 per cent, 37.99 per cent and 37.33 per cent. The typicality of our finding at different age lies from this age. From 63 days onwards the trend changes. Highest moisture percentage was found in female group followed by T_3 and T_1 . There is a significant ($p < 0.05$) difference between T_1 and T_2 group. Moisture per cent in T_3 group varies non-significantly

($p > 0.05$) at this age. This may be due to from 63 days female Vanaraja chicken gain more body weight than corresponding male groups though non-significantly ($p > 0.05$). According to age the litter moisture level increases continuously. The litter material was completely wet and completely caked (Thaxton *et al.*, 2003). High ammonical odours was also emitted. Birds were found to be lying at corners with high levels of discomfort and were gasping heavily (Tablante *et al.*, 1999). Litter sample analysis also shown high burden of coccidial oocyst (Stayer *et al.*, 1995). This level of moisture is highly not recommended.

The above observations were depicted below in both tabular and graphical form for better comparison.

Conclusion :

From above study it is concluded that litter moisture level increases significantly ($p < 0.05$) with advancement in ages. But at 42 days of age the level is higher than that of the recommended level so litter materials should be changed before attaining this age. In accordance with sex male group litter had significantly ($p < 0.05$) higher moisture level than that of female and mixed groups. So from above study we can pen a line that litter moisture is an important parameters in view of birds health and it should be properly monitored and should be changed at a regular interval for a disease free flock.

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