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EFFECT OF FLOOR SPACE ON LAYER PERFORMANCE UNDER WIREFLOOR SYSTEM OF REARING

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The stocking density of the birds play a critical role in determining the production efficiency and has considerable effect on egg production and livability of chicken. The expansion of poultry industry coupled with the increasing cost of construction, generated a tendency to increase the stocking density with a view of maximum utilization of available space. Since the capital investment for housing is one of the important items of non-recurring expenses in new poultry enterprises, it will be more economical, if further reduction in floor space allowance could be made without adversely affecting the production performance. While information on influence of housing systems and stocking densities on layers are available with deep litter and cage system of rearing (Muller *et al.*, 1970, Christmas *et al.*, 1984) similar reports on the performance of layers raised on wire floors are limited. Keeping this in view, the present study was undertaken to assess the influence of floor space on the performance of White Leghorn strain cross layer (ILM-90) under wire floor system of rearing.

Materials and Methods

Single comb White Leghorn Strain Cross layers (ILM-90) at the age of 18 weeks were wing banded, weighed and housed in wire floor system. Two levels of floor space viz. 470 and 700 cm^2/bird were studied in three replicates each, with the flock size of 36 birds in the first group and 27 birds in the second group. The experiment was terminated when the birds completed 44 weeks of age. The duration of the study lasted for 168 days in six 28-day periods from 20 weeks of age.

The allotment of pullets to different treatment groups as well as to different replicates were made at random. The birds were reared under standard managemental conditions throughout the experimental period. Feed and water were provided *ad lib.* Commercial layer mash was fed throughout the experiment. Data on age at sexual maturity, feed consumption, feed efficiency, per cent hen housed egg production, age at 50 per cent production, egg weight, mortality and body weight at 20 and 44 weeks of age were recorded and analysed as per method of Snedecor and Cochran (1967). Ambient temperature (maximum and minimum) and relative humidity were recorded daily throughout the period of experimental study.

Results and Discussion

The analysed data on body weights, egg production, feed intake, feed efficiency, egg weight and mortality are presented in Table 1.

The age at first egg in the flock and the age at 50 per cent production did not differ statistically. The age at first egg laid in the flocks provided 470 and 700 cm^2/bird floor spaces were 153 and 150 days respectively and the age at 50 per cent production in the above flocks were 209 and 188 days respectively. The data obtained on average age at 50 per cent production indicated that the variation in floor space allowance did not influence the age at sexual maturity. The findings of the present study agrees with those of strain *et al.* (1959) and Reddy *et al.* (1981).

Table 1 Influence of bird density on the performance of White Leghorn Strain Gross layers (ILM-90) under wirefloor system of rearing

Floor areas tested (cm^2/bird)	470	700
Birds/group	36	27
Mean body weight at 20 weeks of age (g)	883.43 ± 3.56	941.60 ± 12.4
Age at first egg laid (days)	153	150
Age at 50 per cent production (days)	209	188
Mean hen-housed egg production (%)	51.81 ± 3.34[a]	60.27 ± 2.88[b]
Mean daily feed consumption/bird (g)	103.70 ± 5.88[a]	127.90 ± 6.03[b]
Mean feed efficiency (kg feed/dozen eggs)	2.46 ± 0.10[a]	2.56 ± 0.08[a]
Mean egg weight (g)	54.43 ± 1.11	54.15 ± 0.95
Mean body weight at 44 weeks of age (g)	1470.10 ± 8.63	1489.86 ± 14.63
Mortality (%)	5.13	4.58

Means bearing same superscript in a row do not differ significantly ($P < 0.01$)

The mean hen housed egg production upto 44 weeks of age were 51.81 and 60.27 percentage respectively for groups provided with 470 and 700 cm^2/bird floor space. The trait was significantly ($P< 0.01$) influenced by the treatments. The birds provided 700 cm^2/bird floor space per bird laid more number of eggs than other groups. These results revealed that as floor space allowance per bird increased the egg production also increased. The results of the study corroborate with the findings of Sharma *et al.* (1985) and Mohan *et al.* (1991).

The data on mean daily feed consumption (Table 1) revealed significant difference ($P< 0.01$) among treatment groups. As floor space allowance per bird was increased, feed consumption also increased. The trend of the result agrees with the reports by Bhat and Aggarwal (1989) and Narayanankutty *et al.* (1992).

Though the data on feed efficiency revealed that the efficiency for converting the feed was numerically higher for groups provided 700 cm^2 floor space/bird (2.56) than groups provided 470 cm^2/bird floor space (2.46), statistical analysis did not show any significant difference among the treatment groups. The findings of the present investigation agrees with that reported by Rao *et al.* (1983), Prasad *et al.* (1984) and Sharma *et al.* (1985).

The egg weights averaged 54.43 and 54.15 respectively for those provided 470 and 700 cm^2/bird floor space levels. The trait was not influenced by the treatments. The values obtained in the present study agrees with that of Mathew *et al.* (1979).

There was no significant difference in mean body weight among the different density levels at 44 weeks of age, indicating the lack of influence of floor density on adult body weight in the range studied. This finding is in agreement with those of Reddy *et al.* (1981) and Prasad *et al.* (1984).

The mortality rate for the two different treatment groups were within the standard limits and the treatments did not adversely influence the livability in this study. Mortality percentage was higher in groups provided with less floor space allowance. Reddy *et al.* (1981), Rao *et al.* (1983) and Prasad *et al.* (1984) also reported lack of influence of stocking density on mortality rate.

The maximum and minimum temperature (°C) ranged from 28.0 to 34.0 and 24.0 to 27.0 respectively and relative humidity from 78.44 to 89.71 in the forenoon and 55.43 to 81.67 in the afternoon inside the experimental shed during the trials.

Summary

An experiment was conducted with strain cross White Leghorn layers (ILM-90) from 20 to 44 weeks of age to assess the effect of floor space levels on the production performance of birds raised on wire floors. Two levels of floor space viz., 470 and 700 cm^2 per bird were studied.

The overall mean hen-housed egg production was significantly higher ($P< 0.01$) with floor space of 700 cm^2 per bird (60.27%) than those reared with floor space of 470 cm^2/bird (51.81%). The feed efficiency was better with a floor space level of 470 cm^2/bird than those provided with 700 cm^2/bird floor space, but it was not statistically significant.

Sexual maturity was attained earlier in flocks provided with more floor space. The mean body weight at the end of the experiment was higher in flocks provided 700 cm^2/bird floor space than those provided 470 cm^2/bird floor space. The mortality rate was numerically less in groups provided more floor space. It was concluded that under wire floor system of rearing, laying hens required a floor space of 700 cm^2/bird.

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