

EFFECT OF BIRD DENSITY ON PERFORMANCE OF WHITE LEGHORN HENS IN CAGES

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The stocking density of birds in cages plays an important role in determining the production performance of laying hens. Cage rearing has considerable effect on egg production and livability in chicken. Research evidences indicate that caged layers, in general, show lower feed consumption and superior feed efficiency and better egg weight. Reddy *et al.* (1981) recorded better production with floor space allowance of 0.62 sq. ft. per bird in cages. The influence of housing systems and stocking densities on layer performance are conflicting in the reports of Reddy *et al.* (1981) and Rao *et al.* (1983). The present study was undertaken to evaluate the impact of bird density in cages on performance of layers.

Materials and methods.

One hundred and twenty (120) Single Comb White Leghorn strain-cross (JLM-90) pullets aged 18 weeks were used for the study. The experimental birds were housed in multiple bird cages at the rate of four, five and six birds per cage provided with an average floor area of 700, 560 and 420 cm²/bird respectively. The allotment of birds to different treatment groups as well as replicates was made at random. Standard layer mash prepared according to Indian Standards: 1374 (1979) was provided *ad lib* to the birds. Fresh and clean drinking water

was made available at all times. Routine standard managemental practices were followed throughout the study. The production performance of birds was studied upto 56 weeks of age, in 28-day periods. The age at first egg in the flock, age at 50 per cent production, mean daily consumption, feed efficiency per dozen-eggs, mean egg weight and mortality rate were recorded period-wise. Maximum and minimum temperature and per cent relative humidity in the experimental house were recorded on daily basis. The data were analysed as per methods of Snedecor and Cochran (1967).

Results and discussion

The data pertaining to mean body weight, egg production, feed consumption and efficiency, egg weight and mortality pattern in the three experimental groups are presented in Table 1. The results indicated that the age at first egg in the flock was 131 days. The age at 50 per cent production did not differ statistically among groups. Hence it is inferred that the stocking density in cages did not influence the sexual maturity. These findings are in agreement with the reports of Strain *et al.* (1959) and Reddy *et al.* (1981).

The mean body weight at 20 weeks averaged 1302, 1360 and 1309 g. in the groups of four, five and six birds/cage

Table 1 The overall production performance in White Leghorns from 21 to 56 weeks of age as influenced by different cage densities

	Floor space: cm ² /bird		
	(700)	(560)	(420)
Number of birds per cage	4	5	6
Mean body weight (20 wk) (g)	1302	1360	1309
Mean body weight (56 wk) (g)	1501	1476	1397
Age at 50% productions (days)	153	157	155
Mean H.H. production (%)	65.87	63.99	64.42
Mean daily feed consumption (g)	137.9 ^a	130.5 ^a	118.8 ^b
Mean feed efficiency (kg/doz)	2.58 ^a	2.54 ^a	2.33 ^b
Mean egg weight (g)	54.5 ^a	54.2 ^a	53.3 ^b
Mortality number *	1	5	9

Means bearing same superscripts in a row did not differ significantly.

respectively with floor space of 700, 560 and 420 cm²/bird. In the corresponding groups the means of body weight at 56 weeks of age were 1501, 1476 and 1397 g. respectively. The body weight showed a declining trend when the floor space was decreased. The body weight was higher in the group reared with four birds per cage. It was lowest in the group of six birds per cage. However the difference in weight was not statistically significant. These results are in agreement with the study of Reddy *et al.* (1981) and Rao *et al.* (1983).

The egg production upto 56 weeks of age was 65.87, 63.99 and 64.42 per cent in the groups of four, five and six birds/cage. This study indicated that the egg production was higher in the group given floor space of

700 cm²/bird. Eventhough the difference was not statistically significant the trend showed that the four bird group laid more number of eggs in comparison to the five and six bird groups. These results corroborate with the findings of Mohan *et al.* (1991) and Geo *et al.* (1992).

The daily feed consumption per bird showed marked variation between groups. The mean daily feed intake was 137.9, 130.5 and 118.8 g. in the group of four, five and six birds/cage respectively and the magnitude of difference was statistically significant ($P < 0.01$) among themselves. It indicated that the feed consumption was increased with increase of floor space. The trend of results agreed with the reports of Narayanankutty *et al.* (1992) and Geo *et al.* (1992).

The feed efficiency values averaged 2.58, 2.54 and 2.33 in the groups of four, five and six birds/cage respectively. The poorest efficiency was recorded in the four bird group given floor space of 700 cm²/bird. It was statistically significant ($P < 0.01$) in comparison to the other two groups. In the six bird group given floor space of 420 cm²/bird the feed efficiency was found to be better. Prasad *et al.* (1984) also reported that the birds given less space utilised the feed more efficiently and this is in agreement with the result of present investigation. The general trend in respect of feed efficiency values recorded in this study is in line with the studies of Narayanankutty *et al.* (1992) and Geo *et al.* (1992).

The mean egg weight for the groups of four, five and six birds/cage was 54.5, 54.2 and 53.3 g. respectively. In the former two groups given more space, the egg weight was significantly higher ($P < 0.01$) in comparison with the latter group given less floor space. Similar observations were reported by Geo *et al.* (1992).

The mortality rates in the various groups did not differ statistically. However, the mortality was slightly higher in the group of six birds reared with lesser floor space in comparison with other groups given more floor space. Reddy *et al.* (1981) also reported lack of significant influence on mortality due to stocking density.

The maximum and minimum temperature inside the experimental house during the experimental period ranged from 28.2 to 31.9°C and 22.6 to 25.3°C respectively. The mean per cent relative humidity in the forenoon ranged from 65.1 to 87.0 and that in the afternoon ranged from 44.9 to 80.3 per cent during the trial period.

Summary

An experiment was conducted in White Leghorn strain cross (ILM-90) layers in cages during the period from 21 to 56 weeks of age in order to study the effects of bird density on the performance of layers in multiple-bird cages. Three floor space allowances viz., 700, 560 and 420 cm²/bird in groups of four, five and six birds/cage were employed in the study.

The results revealed that the mean daily feed consumption and feed efficiency were significantly better in the cage floor space of 420 cm²/bird with a stocking density of six birds/cage. But in this group the mean egg weight was significantly low and the mortality was very high. Therefore, based on the overall findings it was concluded that groups of four birds per cage with a floor space of 700 cm² per bird is optimum for rearing layers in multiple-bird cages as there was numerically higher egg production with significantly higher egg weight with relatively low mortality rate.

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