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STUDY ON OPTIMUM NUMBER OF FEMALES PER MALE FOR MAINTAINING NORMAL FERTILITY IN WHITE LEGHORN BREED.

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The study was conducted to determine the number of females per male to maintain optimum fertility in White Leghorn breed. Seventy eight layers were randomly divided in six groups (A,B,C,D,E and F) in such a way that there were 8, 10, 12, 14, 16 and 18 hens in each group respectively. One randomly selected male was allowed to run with each group. The average fertility percentages were found to be 92.61, 89.47, 90.64, 85.97, 89.35 and 78.39 in the respective groups. The highest fertility of 92.61 per cent was found in group A where 8 hens were mated to a cock where as it was lowest in group F where 18 hens were allowed to a cock. There was no significant difference in fertility percentages of groups A, B, C and E. However significant differences were observed between groups A-D, A-F, B-F, C-F, E-F. It was concluded that 8 to 12 females per male may be mated in White Leghorn breed without adversely affecting the fertility level.

INTRODUCTION

A number of factors tend to lower the fertility of eggs in poultry. Some of these are extreme weather, filth, dampness and diseases Breed, age and state of health of the birds also influence it (Waite, 1929). Fertility is directly dependent on the number of males present in a flock. Males are considered to be responsible for fertility which is one of the most important aspect of poultry enterprise. The present study was conducted to find out the optimum number of females which may be allowed to a male in White Leghorn breed without adversely affecting the fertility level. It is hoped that the information thus gained will help in cutting down the expenses on maintenance of non essential breeding males and will also reduce the social stress orginating from peck order and gallantry.

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MATERIALS AND METHODS

Seventy eight mature White Leghorn layers of same age were taken and housed in total confinement conditions and were provided 3 square feet space per bird. The birds were randomly divided into six groups, viz., A,B,C,D,E and F in such a way that there were 8, 10, 12, 14, 16 and 18 hens in each group respectively. Each group was provided with one randomly selected White leghorn male. The male in each pen was replaced each month by another cock to minimise the chances of preferential mating.

Randomly selected eggs from each group were set in an incubator in separately labelled trays every week. The incubated eggs were candled on every eighteenth day. The infertile eggs were counted and removed from the incubator. Records on percentage fertility in each group were maintained for six months of experimentation. The data was statistically analysed and the group means compared by Duncan's Multiple Range test.

RESULTS AND DISCUSSION

The data on percentage fertile eggs per week were collected for a period of six months for each group. The average percentage of fertile eggs in groups, A,B,C,D,E and F were 92.61, 89.47, 90.64, 85.97, 89.35 and 78.39 respectively. (Table 1). The highest fertility was found in group A where 8 hens were mated to one cockerel whereas it was the lowest in group F where 18 hens weremated to one cockerel. No statistical differences were observed in groups A,B,C and E. (Table 2). The differences between groups A and D, A and F, B and F, C and F, and E and F were highly significant ($P < 0.01$) whereas, group B was significantly ($P < 0.0$) better than group D The interesting finding was that group D in which 14 hens were mated to one cockerel, was inferior to group E in which one cock was mated to 16 hens and the difference was found to be significant.

TABLE 1. Analysis of variance of fertile eggs in different groups

Source of variation	*D.F.*	*S.S.*	*M.S.*	*F.R.*
Week	24	8999.98	374.99	
Treatment	5	3592.78	718.55	6:2863**
Error	118	13487.89	114.304	
Total	147	25080.65		

**Highly significant

TABLE 2: Significance of Differences among various groups by the Duncan Multiple Range Test.

Groups	Degree	$\bar{x}$ —F	$\bar{x}$ — D	$\bar{x}$ — B	$\bar{x}$ — E	$\bar{x}$ — C
A	82.164	14.842**	12.155**	5.994NS	5.668NS	4.932NS
C	77.232	10.910**	7.223*	1.062NS	0.736NS	
E	76.496	9.174**	6.482*	0.326NS		
B	76.170	8.848**	6.161*			
D	70.009	2.687NS				
F	67.322					

NS Non significant

** Highly significant

* Significant

The possible reason for this lowered fertility can be attributed to the presence of two cocky hens in this group which did not encourage the male to mate with them and continuously produced infertile eggs. The results are incorroboration with those of Hays and Sanborn (1939), who found that the percentage of fertile eggs was not affected when the number of females mated to each male ranged from 1 to 14. Waite (1929) had pointed out that the number of females that could be mated to one male varies greatly. He observed that more females could be mated with a male in Spring than during other seasons especially Winter and Summer. The other reason could be the incidence of respiratory disease in three hens during the study. Waite (1929) suggested that disease conditions in layers might affect fertility. Taylor *et al.* (1953) also pointed out that fertility and hatchability of eggs produced by many birds in the flocks affected by infectious coryza or any other respiratory disease were severely and possibly permanently lowered.

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