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## **STUDYING THE EFFECT OF STOCKING DENSITY ON SOME ASPECTS OF PIGEONS PERFORMANCE**

BY

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### **INTRODUCTION**

Crowdness is one of the important factors that affect adversely the production of poultry and it is defined as an impact upon the physiology of individual (Weaver et al., 1982) and also indicates an environmental condition that is hostile to the wellbeing of the organism and increases individuals variability and decrease production (Wyne et al., 1960, Southwick, 1971, Bolton et al., 1972, Gill & Leighton; 1984).

Recent developments have now made it possible to produce pigeons under intensive production.

The aim of this work is a trial to investigate the effect of density on some aspects of pigeons performance.

### **MATERIAL AND METHODS**

#### **Pigeons:**

Four flock of healthy Baladi pigeon were used for the experiment. The flocks were numurated as A,B,C, and D, the numbers of pairs in the flocks were 500, 400, 200 and 150 respectively.

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**Housing system:**

Thr flocks were kept separately each under closed pige n loft at El-Saf-Giza Government. the pigeon loft was made of bricks and wire with a corrugated asbestos roof. Perches were used in the form of ne-  
 sting-shelves and provided with holes as nests (30x  
 30x30 cm). The perches were fixed in the inner surf-  
 ace of the brick wall (Fig. 1). The flocks were kept  
 on floor space and volume allowance as follows:

Pigeon flock	No. of the flock (No. of pairs)	Floor area of the loft m <sup>2</sup>	Floor allow- ance, pairs/ m <sup>2</sup>	Volume allowance of each pair/ m <sup>3</sup>
A	500	50	10	0.250 m <sup>3</sup>
B	400		8	0.375 m <sup>3</sup>
C	200	m <sup>2</sup>	4	0.750 m <sup>3</sup>
D	150	50	3	1 m <sup>3</sup>

Water and feed were offered daily *ad libitum*.  
 Also a programme of multi vitamins and minerals was given mon-  
 thly.

**Technique and observation**

The pigeons were monitored from day one of incubation untill the incubation terminate (hatching). Day one on incubation was defined as the first day on which an egg was presented at the nest of the first morning observation (Allen and Erickson; 1982).

The duration of incubation was recorded according to the hatching of the eggs. The fertility was deter-  
 mined by candling after 3 to 4 days of incubation  
 (Allen and Erickson; 1982). the nest was inspected  
 every day from the 15<sup>th</sup> day of incubation untill the  
 hatching day. The intervals between 1<sup>st</sup>, 2<sup>nd</sup> and  
 3<sup>rd</sup> consecutive egg-lay were recorded (Skutch; 1957).

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Mortality rate was recorded daily to calculate the mortality percent throughout the study.

Productivity percent of each flock was determined by counting the whole number of the squabs of the flock through the study (6 months).

Occurrence of disease was determined by recording the number of contracting natural infection with coccidia and salmonella after assurance of diagnosis, which based on Postmortem examination and direct culture from lesions. Salmonella was identified biochemically (Kauffman, 1966) and serologically (Kauffman, 1972). Coccidiosis was diagnosed and identified according to Morini (1950) and Dorny (1964). Specific treatment was given after diagnosis.

## RESULTS AND DISCUSSION

The results are tabulated in Table (1) and discussed in the following headings:

### Effect of high density on incubation period and consecutive egg layings:

It was appeared that the incubation period was ranged from 17 to 20 days. The mean intervals of incubation period were  $18.1 \pm 0.3$ ,  $18 \pm 0.2$ ,  $17.3 \pm 0.4$  and  $17.4 \pm 0.3$  days for flock A (500 pairs), B (400 pairs), C (200 paris) and D (150 pairs) respectively. Concerning the interval between consecutive egg laying. It was found that flocks of high density (A and B) characterized by long interval as the mean intervals in flock A and B were  $68.2 \pm 0.9$  and  $54 \pm 1$  days respectively. While in case of flocks of suitable density (C and D) were  $42 \pm 0.4$  and  $42 \pm 0.5$  respectively.

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**Productivity:**

Concerning the productivity of the flocks as a whole it is found that the productivity percentage of the suitable density flocks was high than those of high density as shown in Table (1). The productivity in flock A (500 pairs) and flock B (400 pairs) were 50% and 57% respectively, while in flock C (200 pairs) and flock D (150 pairs) were 82% and 85% respectively.

**Mortality of adult:**

As shown in Table (1), high mortality percent was recorded in the flocks of high density (as in flocks A and B). But it was low in flocks of medium density as in flock C. While in flock D (suitable density) there was no mortalities. This findings may indicate a correlation between Crowdness and mortalities of adult in the flocks. This coincided with that was reported by Gill and Leighton (1984) who found that mortality in poultry was affected by stocking density.

**Occurrence of diseases:**

Regarding the incidence of diseases among the flocks, it was found that flock of high density contracted *Salmonella typhimurium* and coccidial infection (*Eimeria labeanea*) several times than those of low or relatively low density. Table (1) indicated that flock A contracted coccidial infection 3 times and salmonella infection 2 times through the period of the experiment.

In addition flock B contracted coccidial infection 2 times and salmonella infection one time. This is in agreement with these reported by Morini (1950) who found that pigeons commonly infected with coccidiosis especially when they were intensively in poor hygienic conditions.

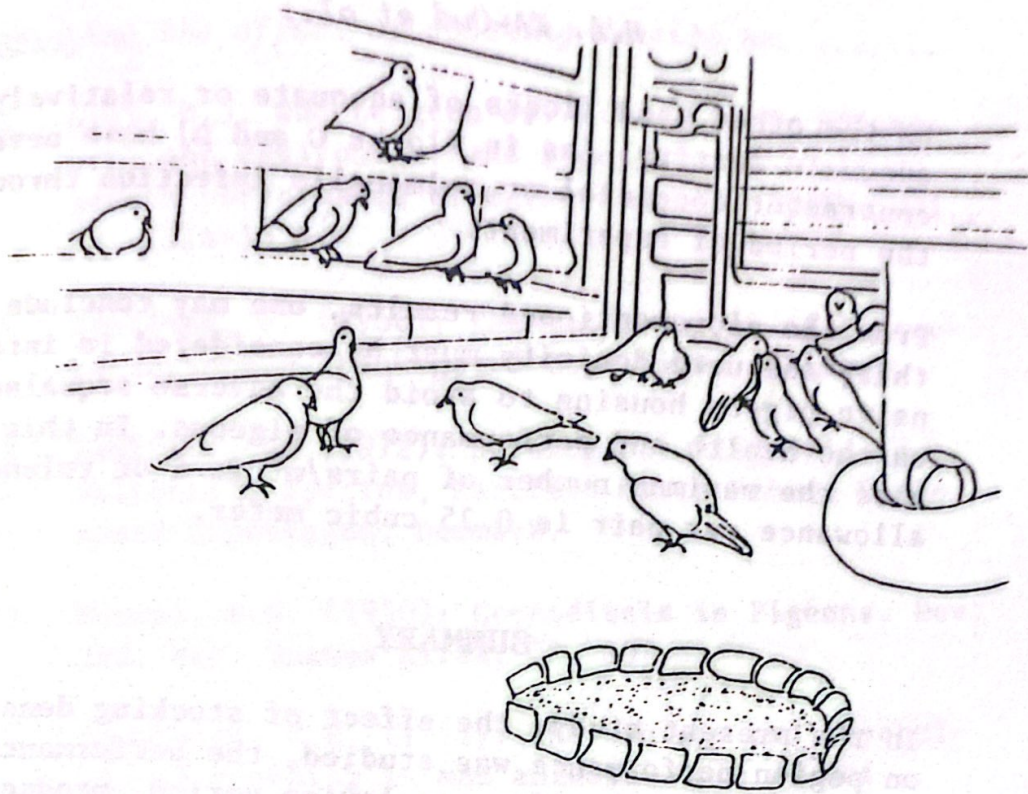


Fig. (1): Pigeon loft with the sets of nesting-shelves.

Table (1): Effect of stock density on pigeon performance

Flock	No. of birds	* Incubation period in days (mean + S.D)	* Interval between consecutive egg laying in day (mean+S.D)	Mortality %	Incidence of Disease		Productivity %
					Cocc.	Salm.	
A	500	18.1 $\pm$ 0.3	68.2 $\pm$ 0.9	10	3	2	50
B	400	18 $\pm$ 0.2	54 $\pm$ 1	9	1	2	57
C	200	17.3 $\pm$ 0.4	42 $\pm$ 0.4	3	-	-	82
D	150	17.4 $\pm$ 0.3	42 $\pm$ 0.5	-	-	-	85

\* : 50 pairs from each flock were used to study the incubation period and intervals between consecutive egg laying.

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ON the other hand flocks of adequate or relatively adequate density. (as in flocks C and D) have never contracter coccidial or salmonella infection through the period of experiment.

From the aforementioned results, one may conclude that, adequate denisity must be considered in intensive pigeon housing to avoid the adverse sequalae on the health and performance of pigeons. In this case the maximum number of pairs/m<sup>2</sup> is 4 or volume allowance per pair is 0.75 cubic meter.

### SUMMARY

In the present study, the effect of stocking density on pigeon performance was studied, the performance was includ, consecutive egg laying period, productivity percent. In addition the sequalae of high stocking was studied (Mortality % and the incidence of some diseases).

High stocking density was influence the period of egg incubation and consecutive laying periods. It also decrease the production and increase the suceptibility to diseases.

### REFERENCES

1. Allen and Erickson (1982): The basis of flock organization in birds in: W.H. Thorpe and O.L. Zangwill. Combridge University Press.
2. Bolton, W., Dewar, W.A., Jones, R.M. and Thompson, R. (1972): Effect of stocking density on performance of broiler chicks. Brit. Poult. Sci. 13: 157-162.
3. Dorney, R.S. (1964): Evaluation of a microquantitative method for counting coccidial oocysts. J. Parasit. 50: 518-522.

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- 4 . Gill, D.J. and Leighton Jr. A.T. (1984): Effects of light environment and population density on growth performance of market turkey. *Poult. Sci.* 63: 1314-1321.
- 5 . Kauffman, F. (1966): The bacteriology of Enterobacteriaceae. Manksgaard Copenhagen. Denmark.
- 6 . Kauffman, F. (1972): Serological diagnosis in Salmonella species, Kauffman White Scheme Manksgard-Copenhagen. Denmark.
- 7 . Morini, E.G. (1950): Coccidiosis in Pigeons. *Rev. Med. Vet. Buenos Aires*, 32, 207.
- 8 . Southwick, C.H. (1971): The biology and psychology of crowding in man animals. *Ohio J. Sci.*, 71: 65-72.
- 9 . Skutch. A.F. (1957): The incubation patterns of birds. *Ibis*, 99: 69-93.
10. Weaver, W.D., J.R., Beme, W.L. and Cherty, J.A. (1982): Effects of light, feeding space, stocking density and dietary energy on broiler performance *Poult. Sci. Sci.*, 61: 33-37.
11. Wyne, J.W., McCartney, M.G., Carter, R.D. and Chamberlain, V.D. (1960): The effect of feeder and floor space upon growing turkeys. *Res. Circ.* 87, Ohio Agr. Exp. Sta., Wooster, Ohio.