

The Relationship between Pause and Egg Laying Characters

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16 FAYOUMI and 13 White Plymouth Rock pullets were available during the first year of laying. Fayoumi pullets laid 4332 eggs, while the Plymouth ones laid 2767 of different cycle lengths. Egg albumen weight and albumen percentage of the first egg in the clutch decreased with the increase in pause length. Yolk percentage increased with the increase in pause length. Meanwhile, yolk weight and shell weight were almost constant with the increase in pause length. Shell percentage increased in Fayoumi and followed irregular trend in the Plymouth with the increase in pause length. In both breeds, yolk index decreased with the increase in pause length until three days pause then increased with the increase in pause length. Yolk colour tended to decrease in the Plymouth and to increase in the Fayoumi with the increase in pause length with 3 days pause then became almost constant. "Haugh" unit of albumen quality increased as pause length increased. Shell thickness decreased with the increase in pause length to four days pause then became almost constant.

The pause is a temporary cessation of laying. Its length may be of one day or it may extend to a week or more (Lerner and Taylor, 1947 and Hutt, 1949). Low temperature of winter seems to stimulate a higher incidence of pause, but does not increase the duration of pause (Hays, 1951). With native breeds, Assen and Ragab (1955) found that the longest pausing season was that occurring in autumn. It was 18.6 days for the Baladi, compared to 21.9 days in the Fayomi. Bennion and Warren (1933) reported that the first egg in a cycle after a pause of 7 days or more was smaller than eggs situated in the cycle previous to the pause. However, Funk and Kempster (1934) found no significant effect on egg weight after a pause. After 2 days, the average egg weight was greater than after a one-day pause. The differences were also true in the 2 and 3 days pauses.

Material and Methods

The effect of pauses of different lengths on the subsequent egg characters was studied in the first laying year of 16 Fayoumi and 13 White Plymouth Rocks pullets. The Fayoumi pullets were all sexually mature and were 6 months of age at the beginning of the study. Also, the Plymouth pullets all in laying condition and 8 months of age at the beginning of the experiment. During the experimental period, the birds were treated, managed and fed alike. The study included 4322 Fayoumi and 2767 Plymouth eggs.

Results and Discussion

Pause length and egg components

Only the first egg in the cycle was studied. Egg weight decrease gradually with the increase in pause length in both breeds. Significant differences were found in egg weight with the increase in pause length or due to breed differences (Table 1). Albumen weight and percentage in both breeds decrease with the increase in pause length until the four days pause in the Fayoumi and five days pause in the Plymouth Rock then increased with the increase in pause length. These variations were significant either due to pause length or due to breed differences. Meanwhile, the yolk percentage followed the opposite trend of albumen percentage. Yolk weight was almost constant with the increase in pause length until 4 days pause in the Plymouth and 5 days pause in the Fayoumi, since its weight decreased in the first breed and increased in the second one with the increase in pause length. Shell weight was almost constant in both breeds with the increase in pause length. In Fayoumi, shell percentage increased with the increase in pause length. Meanwhile, no regular trend can be detected in the shell percentage of the Plymouth Rock. Significant differences were observed between different pause lengths in yolk and shell percentage, while it was not significant in their weights.

The increase in pause length may result in a decrease in the activity of the oviduct during the non-laying period which causes the decrease in albumen weight and percentage and subsequently egg weight. Meanwhile the constant weight of the yolk is due to the fact that the rate of growth of the ova is constant either for ova produced by different hens or by the same hen (Warren and Scott 1935).

Effect of pause length on egg quality

Data presented in Table 2, show that yolk index decreased with the increase in pause length until three days' pause then increased with the increase in pause length. After one day pause the yolk index was 10.98 and 50.72 percent in the Fayoumi and 48.89 percent in the Plymouth Rock after three days' pause. Yolk colour tended to decrease in the Plymouth Rock and to increase in the Fayoumi with the increase in decrease in pause length until the three days' pause then became almost constant. "Haugh" unit increased as pause

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length increased. While shell thickness decreased with the increase in pause length until four days' pause then became almost constant in both breeds. No statistical differences were found between different pause lengths in yolk index, yolk colour and shell thickness. While, the differences in "Haugh" unit were significant. The differences between breeds in "Haugh" unit and shell thickness were highly significant but in yolk colour, the differences were only significant.

TABLE 1. Effect of pause length on the first following egg weight and its components in the Fayoumi and White Plymouth Rock.

Pause length (days)	Fayoumi						
	Egg wt	Albumen		Yolk		Shell	
		wt	%	wt	%	wt	%
1	49.30	28.88	58.58	15.13	30.69	5.33	10.81
2	46.70	26.71	57.19	14.85	31.80	5.14	11.01
3	46.11	25.83	56.02	15.13	32.81	5.15	11.17
4	46.00	25.05	54.45	15.77	34.28	5.18	11.25
5	46.00	25.24	54.87	15.44	33.57	5.32	11.27
6	49.67	28.33	57.04	16.16	32.54	5.18	10.43
<i>Plymouth Rock</i>							
1	57.66	35.95	62.35	16.40	28.44	5.31	9.21
2	56.48	35.18	62.29	16.27	28.80	5.04	8.92
3	55.20	33.74	61.12	16.47	29.84	4.99	9.04
4	54.08	32.86	60.76	16.54	30.58	4.68	8.65
5	53.00	32.24	60.83	15.03	28.36	5.73	10.81
6	51.25	33.88	66.11	12.85	25.07	4.52	8.82

F. values
 different
 Pause
 length 9.9173** 7.7138* 3.0628 0.3902 1.7048 1.7713 2.8627*
 Between
 breeds 3.6566* 30.7169** 64.7319** 0.0577 24.9750** 1.2398 47.6095**

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TABLE 2. Effect of pause length on the first following egg quality in the Fayoumi and the Plymouth Rock breeds.

Pause length (days)	Fayoumi				Plymouth Rock			
	Shell thickness	Haugh unit	Yolk index	Yolk colour	Shell thickness	Haugh unit	Yolk index	Yolk colour
1	13.51	81.00	50.98	6.46	12.35	85.30	50.72	6.96
2	13.47	81.46	49.34	7.24	11.92	85.61	48.88	6.58
3	13.54	82.00	46.79	7.46	11.67	87.00	48.89	6.47
4	13.28	82.61	48.49	7.50	11.17	88.22	49.61	6.25
5	13.00	84.00	48.50	7.50	11.00	88.46	49.66	6.25
6	13.01	82.20	52.14	7.47	11.00	88.79	49.49	6.25

F. values

Between different pause length 4.6167* 6.5897* 1.8650 0.0623

Between breeds 145.6610** 170.9662** 0.0856 8.4969*

The increase in "Haugh" unit value with the increasing pause length may be due to the increase in thick albumen height as a result of the decrease in egg and albumen weight. The decrease in shell thickness as a result of the increase in pause length may be due to the decrease in the activity of the uterus glands during the pause period.

Time of day when the successive eggs in a clutch are laid

The time of the day in which an egg is laid was recorded on each egg. The period of the day which the successive eggs in different clutch length were laid are tabulated in Table 3. The general trend in both breeds showed that each egg laid beyond the first egg in the cycle took place later in the day than the preceding one. The same finding was reported by Lohle and Nauzok (1958) and Lohle and Bock (1965).

Rotchild (1946) reported that the release of the pituitary hormone stimulating the ovulation of the follicle of a clutch occurs between 11 p.m. and 12.30 a.m. Every ovulation takes place after 30.7 min from every oviposition (Warren and Scott, 1935) and the time period between the eggs

laid in succession is usually over 24 hr accordingly. Eggs produced in successive days were laid at a later hours each day and gradually approached the end of the day. Since the hen does not lay during darkness, then one day of oviposition is missed and a new clutch is started in the following morning. The retardation in time of laying the single egg of the one egg laying cycles to a late period of a day may be due to the long time needed for its formation.

TABLE 3. Periods of day when successive eggs in different clutch length are laid

Breed	Clutch size	Position of egg in clutch						
		1st	2nd	3rd	4th	5th	6th	7th
Fayoumi . .	1	3						
	2	2	3					
	3	2	3	4				
	4	2	3	3	4			
	5	1	2	2	3	4		
	6	2	2	3	3	3	4	
	7	2	2	3	3	3	3	4
Plymouth . .	1	3						
	2	2	4					
	3	1	3	4				
	4	2	3	3	5			
	5	2	2	2	3	5		
	6	2	2	2	3	4	5	
	7	1	2	2	3	3	3	4

- N.B. 1 = The period before 9 a. m.
 2 = The period from 9 to 11 a.m.
 3 = The period from 11 a.m. to 1 p.m.
 4 = The period from 1 to 3 p.m.
 5 = The period after 3 p.m.

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العلاقة بين فترة الراحة وصفات وضع البيض

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درست ٤٢٢٢؛ بيضة فيومي و ٢٧٦٧ بليموث أبيض كانت ذات دورات وضع مختلفة . ودرست أوزان البيض والبياض والصفار وأسيتها لأول بيضة في السلسلة وكانت أكبر ما يمكن . ونقصت نسبة الصفار بتقدم وضع البيضة في السلسلة . وكان وزن الصفار والقشرة ثابتا لم يتغير بطول السلسلة . وزادت نسبة القشرة في الفيومي مع طول سلسلة وضع البيض . وانخفضت صفات الصفار من حيث اللون والحجم بتقدم وضع البيضة في السلسلة . بينما تحسنت صفات البياض بتقدم وضع البيضة في السلسلة وانخفضت صفات سمك القشرة .