Vol. XII (3-4), 1975

STUDIES ON THE EFFECT OF BREED AND SEASONAL VARIATIONS ON THE INTERIOR QUALITY OF EGGS.

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The experiment was conducted to see the effect of breed and season on the physical qualities of the eggs. The breeds used in the study were White Leghorn, Lyallpur Silver Black and desi (local). The experiment was spread over 4 seasons namely, spring, summer, autumn and winter. The data on egg weight, albumen thickness and shell thickness were subjected to analysis of variance. Due to insufficient data, the analysis, however, could not be performed on blood and meat spots. The White Leghorns had the best performance with the highest egg weight and thick shells and albumen. The meat and blood spot incidence was also less in the eggs laid by the White Leghorn breed as compared with Lyallpur Silver Black and in local chickens. It was found that the eggs laid in winter were superior in respect of egg weight, albumen and shell thickness. The spring and autumn laid eggs were almost identical in these factors, while those laid in summer, had the thinnest shells and albumen and the least egg weight. The incidence of blood and meat spot was found to be highest in summer. In other seasons it was less and did not differ appreciably.

INTRODUCTION

The egg though designed by nature solely for reproductive purpose, has become one of the leading ogricultural commodities in the world's market. Their importance can be attributed to the fact that in preparing a self contained reporductive unit, nature had to endow the egg with all nutrients needed for developing a living organism, and, therefore, eggs are important in the human diet. Until recent years a few people were interested in the difference between low quality and high quality eggs. The term quality when applied to market eggs means the conditions of the shell and contents of eggs which give the greatest satisfaction to the consumers.

The possibility of breed differing with respect to interior quality of the eggs was investigated by many workers in other countries. No study has so

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far been conducted in our country to determine the effects of breed and seasonal varitions on the quality of the eggs. This study therefore, envisaged a comparison of the interior quality of eggs of a newly evolved breed, namely, Lyallpur Silver Black with that of White Leghorn and desi (local) chickens.

MATERIALS AND METHODS

Sixty birds each of White Leghorn, Lyallpur Silver Black and desi breeds were used in the study. The experimental birds were of the same age and raised under similar managemental conditions. They were fed with lever's layer mash *ad libitum* during the experimental period. Ten eggs from each breed were randomly collected for six consecutive weeks, in spring, summer autumn and winter. Weight of the individual eggs were recorded for comparison. All the eggs were broken and their albumen thickness was measured with a travelling microscope. The egg shell thickness was measured by using the spherometer. The presence of blood and meat spots were also examined.

RESULTS AND DISCUSSION

The egg weights of the three breeds, namely White Leghorn, Lyallpur Silver Black and Local chicken differed greatly. The White Leghorns had the highest, the local chicken the lowest and the Lyallpur Silver Blacks had intermediate egg weights (Table 1). The results are in accordance with those of Funk and Kempster (1934). The eggs laid during winter were heaviest followed by those laid during autumn, spring and summer (Table 2). The evidence as to the effect of high ambient temperature on the egg was produced by Warren et al. (1950), who reported that the egg size during the first year laying period increased only when the summer temperatures were not high. The data in Tables 1 and 2 revealed a difference in albumen thickess of eggs of different breeds in different seasons. The effect of season on the thickness of egg albumen was pronounced. The mean egg albumen thickness in winter season was 6.72 millimeter which was highly significantly different from that in spring (mean 5.94 millimeters), autumn (mean 5.34 millimeters) and summer (5.15 millimeters) seasons. The results are in agreement with those of Munro (1938). The average shell thickness of eggs of the three breeds is given in Table 1. It is evident from the data that the shell thickness differed in different breeds. The shell thickness increased from 0.322 millimeter in local chicken to 0.339 millimeter in White Leghorn birds. While the difference between the egg shell thickness of White Leghorn

TABLE 1. *Averages of weight, albumen thickness and shell thickness of eggs laid by different breeds.*

Breed	Egg weight (gm)	Albumen thickness (m.m.)	Shell thickness (m.m.)
White Leghorn	57.30	6.29	0.339
Lyallpur Silver Black	54.77	5.92	0.328
Local chicken (Desi)	41.87	5.15	0.322

TABLE 2. *Averages of weight, albumen thickness and shell thickness of eggs laid during different seasons of the year.*

Season	Egg weight (gm)	Albumen thickness (m.m.)	Shell thickness (m.m.)
Winter	55.96	6.72	0.343
Autumn	51.80	5.94	0.318
Spring	46.65	5.34	0.340
Summer	46.65	5.15	0.308

and the Lyallpur Silver Blacks was non significant, whereas the difference in the thickness of egg shell of White Leghorns and local chicken was observed to be highly significant. The Lyallpur Silver Black birds did not differ significantly from local chicken in egg shell thickness. These findings are in agreement with those of Van-Wagenen et. al. (1937). The egg shell thickness of all the breeds varied significantly in different seasons. The shell thickness was found to be highest in winter and was lowest in summer (Table 4). The shell thickness ranked 2nd and third in spring and autumn respectively. These findings are in accordance with those of Hyler and Geake (1964) who found that the shell thickness of the eggs was greater in winter and least in summer. The number of blood and meat spots observed were very small, thus it was not possible to perform the analysis of variance. The Table 3 shows the number of blood and meat spots recorded in different breeds during different seasons. As is obvious from the data in the table that blood and meat spots varied in different breeds. The results are in accordance with those of Quinn and McNally (1950). However, these findings do not substantiate those of King and Hall (1955) who found a greater number of blood and meat spots in eggs laid by White Leghorn birds than in heavy breeds. The results are also in agreement with those of Adams et al. (1951) who did not find any difference in the incidence of the spots in different breeds. The contradictory results can also be attributed to mere chance because the number

TABLE 3. *Incidence of blood and meat spots in eggs of different breeds laid during different seasons of the year.*

Season	White Leghorn		Lyallpur Silver Black		Local chicken	
	Blood spot	Meat spot	Blood spot	Meat spot	Blood spot	Meat spot
Spring	1	2	2	1	2	1
Summer	4	1	2	2	3	1
Autumn	1	1	2	0	1	1
Winter	1	1	2	0	1	1
Total	7	5	8	3	7	4

of observations was very small. The number of blood and meat spots was greatest in the summer season while the rest of the seasons had only few. The results are in agreement with those of Lerner and Smith (1942).

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