COMPARATIVE STUDY OF EGG COMPOSITION OF LYALLPUR SILVER BLACK, WHITE LEGHORN AND LOCAL LAYERS

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The chemical composition of eggs of Lyallpur Silver Black was compared with those of White Leghorn and local breeds of chicken. Thirty layers from each breed were used in the study. The birds in the 3 groups were provided Lever's layer mash and water *ad libitum*. Six eggs from each breed were selected randomly each week and were chemically analysed. The statistical analysis revealed that White Leghorn and Lyallpur Silver Black breed differed non-significantly in respect of dry matter, crude protein, ether extract and carbohydrate contents of their eggs. However, the two breeds (White Leghorn and Lyallpur Silver Black) had significantly higher dry matter, and crude protein contents of eggs than the local breed. The ether extract contents were significantly higher in the eggs of White Leghorn than those of the local breed, but the difference in ether extract contents of eggs between Lyallpur Silver Black and the local breed were non-significant. The eggs of the local breed had significantly higher carbohydrate contents as compared to those of the White Leghorn. The Lyallpur Silver Black and the local breeds, however, did not show any significant difference in carbohydrate contents of their eggs. Total ash contents of eggs of White Leghorn, Lyallpur Silver Black and the local chicken did not differ significantly.

INTRODUCTION

The status of nation's health is determined by the type of food taken by its people. The situation in Pakistan in this regard is unfortunately not very encouraging. The daily per capita intake of protein of animal origin in our country is about 8.7 grams (Akram, 1965) as against the recommended quota of 37 grams (Mottram, 1963). This is probably one of the lowest intake of protein of animal origin in the world. What is needed is to improve the performance of existing low producing livestock and poultry. In recent years efforts have been rewarded in evolution of a new breed namely Lyallpur Silver Black at the Poultry Experiment Station, West Pakistan Agricultural University, Lyallpur and various aspects of this breed have been studied.

For convenience and culinary virtues, and for dietetic values the egg is prized above most animal protein foods. In view of the virtues of the egg its protein being of highest biological value, its highly emulsified fat, its calcium,

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iron and phosphorus and its vitamins content, its digestibility, the egg remains, and rightly so, prized in nutrition. No effort has so far been made to study the chemical composition of egg of Lyallpur Silver Black. It was thus thought logical to study this aspect of this new type of chicken and compare it with that of White Leghorn and the local chicken.

REVIEW OF LITERATURE

Almquist and Lorenz (1933) found a highly significant difference in albumen solids among different breeds of fowl. Cotterill and Winter (1954) analysed eggs from different hens and different strains for total solids and total protein. They found that there was wide variation in these constituents in eggs from different hens and strains. Arroyave *et al.* (1957) pointed out that hens from different stocks might produce eggs differing in protein and ash contents. Both strains and age of the layer influence the composition of eggs (Jenkins and Tyler, 1960). Edwards *et al.* (1960) while studying the cholesterol contents of eggs from various breeds and strains of chicken reported that strain differences were found to influence significantly the fat contents of egg. It was observed by May and Stadelman (1960) that hens from different stocks produced eggs differing in moisture and protein contents. Edwards (1964) found a significant difference in fatty acid composition of egg lipids in the eggs from different strains within the same breed. Marion *et al.* (1965) studied the eggs from 5 different stocks of hens and found significant difference in per cent yolk, moisture, lipid and fatty acid contents.

MATERIALS AND METHODS

Thirty laying hens of approximately the same age from each breed, Lyallpur Silver Black, White Leghorn and local chicken were selected at random from respective flock maintained at Poultry Experiment Station, West Pakistan Agricultural University, Lyallpur. The birds of each breed were housed separately in open under similar environment and management. The birds were fed Lever's layer mash *ad libitum*. Fresh and clean water was available to the birds at all times. Six eggs (sample) were selected at random from the daily collection of each breed once a week on the same day throughout the experimental period of 15 weeks. The sampled eggs were stored at room temperature over night. They were broken in separate beakers next morning and were homogenized with electric shaker. A weighed amount from the homogenized material was drawn in previously weighed clean dry china dish and were quickly placed in a vacuum oven maintained at 70°C. The samples were dried to a constant weight and were then transferred immediately to desiccators and were weighed after cooling. The dried samples were kept in labelled air tight

bottles for further analysis. The dried and ground egg samples were analysed for different constituents, including crude protein, ether extract, total ash and total carbohydrates. The data were subjected to statistical analysis using analysis of variance (Snedecor, 1960).

RESULTS

The data on dry matter, crude protein, ether extract, carbohydrate and ash contents of eggs of White Leghorn, Lyallpur Silver Black and local chicken are summarized in Table 1.

TABLE 1.—*Showing Chemical Composition of eggs of white Leghorn, Lyallpur Silver Black and Local breed of chickens (In Percentage)*

Breeds	Dry matter	Crude protein	Ether extract	Total carbohydrates	Total ash
White Leghorn ..	26.57	13.126	11.54	0.89	1.01
Lyallpur Silver Black ..	26.35	12.912	11.43	1.16	1.00
Local chicken ..	25.16	11.432	11.37	1.29	1.00

Dry matter contents of the eggs of White Leghorn and Lyallpur Silver Black were significantly ($P<0.01$) higher than those of the local chicken. But differences in dry matter contents of egg of White Leghorn and Lyallpur Silver Black were statistically non-significant. The crude protein contents of White Leghorn and Lyallpur Silver Black breeds were significantly ($P<0.01$) higher as compared to protein contents of local layers. The differences in the crude protein contents of White Leghorn and Lyallpur Silver Black were non-significant. There were significantly ($P<0.05$) higher ether extract contents in the egg of White Leghorn as compared to local chicken. The differences between the ether extract contents of Lyallpur Silver Black and local breed were non-significant. Similarly, the differences in ether extract contents of eggs of White Leghorn and Lyallpur Silver Black were also non-significant. The total carbohydrate contents of the local chicken were found to be significantly ($P<0.01$) higher than those of White Leghorn. The difference between the carbohydrate content of eggs of Lyallpur Silver Black and local chicken was non-significant. The differences in total carbohydrates in the egg of White Leghorn and Lyallpur Silver Black were also significant. The total ash contents of eggs of White Leghorn, Lyallpur Silver Black and local chicken were found to be non-significant.

DISCUSSION

The results of the present study indicate that dry matter cotents of eggs of White Leghorn and Lyallpur Silver Black breeds were significantly greater than those of local breed. Although there were apparent differences in the dry matter contents of the eggs laid by White Leghorn and Lyallpur Silver Black layers but the differences were found to be non-significant. These findings are in close agreement with those reported by Cotterill and Winter (1954). May and Stadelman (1960) and Marion *et al.* (1965) who reported that different breeds varied in their egg dry matter contents.

The crude protein contents of eggs of White Leghorn and Lyallpur Silver Black breeds were found to be significantly higher as compared to that of the local breed. These results are in line with those of Arroyave *et al.* (1957), May and Stadelman (1960) and Almquist and Lorenz (1933), who reported that breed accounts for the difference in the protein contents of the eggs. The higher rate of production in White Leghorn may be responsible for greater synthesis of protein in the eggs.

Ether extract contents of White Leghorn eggs were significantly higher than those of Lyallpur Silver Black and local breed. Similar results have been reported by Edwards *et al.* (1960), Edwards (1954) and Marion *et al.* (1965), who observed different lipid contents in different breeds and strains of birds. Significantly greater amount of carbohydrates was found in the eggs of local breed than that of White Leghorn, but Lyallpur Silver Black and the local breed did not show statistical difference in carbohydrate contents of the eggs. Again no significant difference in carbohydrate contents of eggs of Lyallpur Silver Black and White Leghorn breeds were observed. Non-significant differences in the total ash contents of the eggs of breeds under test were determined. These results are not in accordance with Arroyave *et al.* (1957) who reported breed differences in respect of contents of the eggs.

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