COMPARATIVE STUDY OF WEIGHT GAIN AND FEED EFFICIENCY IN WHITE CORNISH AND LYALLPUR SILVER BLACK CHICKS UP TO 10 WEEKS OF AGE

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The growth rate and feed efficiency of eighty-one day old chicks each of White Cornish and Lyallpur Silver Black up to 10 weeks was studied. The White Cornish chicks were significantly heavier than Lyallpur Silver Black when day old. Non-significant differences in live weight in birds of both the breeds were observed except the 1st and 2nd weeks, in which Lyallpur Silver Black chicks were significantly heavier than White Cornish ones. The feed intake by Lyallpur Silver Black chicks remained higher than White Cornish throughout the experimental period. However, significant differences were only found during 2nd, 3rd, 4th, 5th and 6th weeks. White Cornish chicks were found to be more efficient in utilizing the feed than Lyallpur Silver Black. Only 3 chicks from Lyallpur Silver Black and one from White Cornish died in the initial stages of experiment.

INTRODUCTION

The existing population of poultry in villages comprises mostly low producing uneconomical type of *Desi* (local) chicken. Introduction of high producing foreign breeds of poultry has been attempted in Pakistan but they could not thrive in the villages due to their low resistance against diseases and heat. The crucial problem in increasing the poultry meat production is that of increasing the productivity and feed efficiency of the local birds to a profitable level while exploiting their disease and heat resistance potentials. One of the methods for accomplishing this is to crossbreed *Desi* stock with the imported breeds of chicken.

Lyallpur Silver Black has been evolved at Poultry Experiment Station, West Pakistan Agricultural University, Lyallpur by crossing 3 exotic breeds White Leghorn, White Cornish and New Hampshire with *Desi* to combine the high productivity of foreign breeds as well as heat tolerance and disease resistance potentials of local birds. The study under report aimed to compare the growth rate and feed efficiency of Lyallpur Silver Black and White Cornish breed of chickens under the existing local conditions prevailing at Lyallpur.

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REVIEW OF LITERATURE

Znaniecka (1961) observed that the effect of crossbreeding on chick growth up to 8 weeks of age depended both on the breed of the parents and the direction of the cross. The early growth rate of chicks from interbred matings were generally intermediate between the growth rates of the parental breeds. The arithmetic mean for growth rate of the reciprocal crosses was higher than the means of the parents.

Gintovt *et al.* (1962) compared reciprocal crosses of Cornish with the White Plymouth Rock and Anniversory breeds with pure breed Cornish. The crossbred and pure bred were found to be equally efficient in the utilization of feed at 90 days of age. However, Koci (1962) observed poor feed efficiency in crossbreds as compared to pure breds. The birds under test were New Hampshire, White Plymouth Rock and their crosses with White sussex Rhode Island Red and White WyandoHes.

Jaap (1963) reported that the weight gain in 8 weeks from selective breeding was very small in strains already at very high level of growth rate Schneider (1963) compared White Rock with Cornish X White Rock X Leghorn crossbred birds and found that the body weight of 8 weeks averaged 721 and 810 grammes respectively and at 10 weeks 1048 and 1098 grammes respectively. It was also observed that the Cornish and White Rock and Leghorn broiler crosses were superior to White Rock pure breds. It was observed that the White Rock consumed 0.70 Kg. less feed than the crossbreds to gain the same weight, the White Rocks required 2.23 Kg feed per Kg gain between 8 and 10 weeks of age as compared with 3.93 Kg for the crossbreds.

Siddiqui (1965) observed that the chicks of White Cornish breed were significantly ($P < 0.01$) heavier than the White Cornish male × Desi female and Desi males and White cornish females chicks when day old. The feed efficiency remained highest in White Cornish male × *Desi* female chicks at 4 and 8 weeks. However, at 12 Weeks both the reciprocal crosses and White Cornish purebreds were equal in growth rate and feed efficiency. Sljusar (1966) compared Cornish, White Plymouth Rock, pure breds and their cross breds and observed 97.2, 94.4 and 92.1 per cent viability for crossbred, Cornish pure bred and White Plymouth Rocks respectively at 70 days of age.

MATERIAL AND METHODS

Eighty one-day old chicks each of White Cornish and Lyallpur Silver Black birds obtained from the Poultry Experimental Station, West Pakistan Agricultural University, Lyallpur, were used in this study to compare growth rate and feed efficiency up to 10 weeks of age. The chicks were wing banded,

weighed individually and were divided into 4 groups of 20 chicks each. The birds were kept in thermostatically heat controlled battery brooders which were divided into 2 equal compartments. Each compartment was randomly allotted to each group. Commercial broiler mash and fresh water was given *ad libitum*, Individual chick weights and feed consumption were recorded at weekly interval and feed efficiency was calculated. Records of mortality were also kept. The chicks were vaccinated against Newcastle disease at day old age by intra-ocular method and at 4 weeks age intramuscularly. The data was subjected to statistical analysis (Snedecor, 1956) for different characters.

RESULTS AND DISCUSSION

Growth. The average weight of day old White Cornish and Lyallpur Silver Black chicks were recorded to be 27.55 and 25.86 grammes respectively. The White Cornish chicks were significantly heavier ($P<0.01$) than Lyallpur Silver Black. The findings substantiate those of Siddiqui (1965) who found that the chicks from the Cornish breed were significantly heavier ($P<0.01$) than reciprocal crosses of White Cornish and *Desi* at day old age.

The average live weight recorded at 70 days of age was 911.18 and 866.53 grammes for White Cornish and Lyallpur Silver Black chicks respectively (Table 1). The Lyallpur Silver Black birds exhibted faster growth rate during 1st, 2nd, 3rd, 4th, 5th and 6th weeks as compared to White Cornish breed. The results are in partial agreement with Schneider (1963), Solonina and Kopylovskaja (1965) and Siddiqui (1965) who found that the growth rate of crossbred was greater than purebred progenies. This could be assigned to the effect of heterosis of hybrid vigour in the initial growth stages of the Lyallpur Silver Black chicks. Znaniecka (1961) has suggested that early growth rate of chicks depended both on the breed of the parents and on the direction of the cross. The data of weekly weight gain revealed non-significant differences of breeds and interaction of breeds × weeks.

The White Cornish birds gained significantly ($P<0.01$) more weight during 8th week followed by 6th, 7th, 9th, 4th weeks. In Lyallpur Silver Black chicks, maximum gain in weight was recorded during the 8th week followed by 4th, 9th, and 6th week respectively. The weekly weight gain during the 4th, 5th, 8th, and 9th week were significantly ($P<0.01$) better than 1st, 2nd, 10th and 3rd weeks. The White Cornish chicks were significantly heavier than Lyallpur Silver Black during 1st and 2nd weeks only. These results are strongly supported by Sljusar (1966) who reported that early growth of crossbred exceeded those of purebred, but at 70 days of age the average body weight of crossbreds were lower than the purebreds.

Feed Consumption. The weekly feed consumption was greater in Lyallpur Silver Black than White Cornish throughout the period of study. The analysis of variance of the data on weekly feed consumption revealed significant differences between breeds, and among weeks whereas interaction between breeds and weeks was found to be non-significant.

In White Cornish chicks, highest feed consumption was recorded in the 9th and 10th weeks followed by 7th and 8th weeks. Lowest feed consumption was recorded during the first three weeks and differences among them were non-significant. In Lyallpur Silver Black birds, lowest feed intake was observed in 1st, 2nd and 3rd weeks, but the differences among them were non-significant.

The average total feed consumption per chick up to 10th week was 3417.74 grammes and 3088.67 grammes for Lyallpur Silver Black and White Cornish respectively and the difference between the two was statistically non-significant (Table 1). The feed intake by Lyallpur Silver Black chicks, however, remained higher than White Cornish chicks throughout the experimental phase. There was significant ($P<0.05$) difference in feed intake during 2nd, 3rd, 4th, 5th and 6th weeks, whereas non-significant differences were observed during the remaining period. These results are supported by Schneider (1963) who found that purebreds consumed less feed than crossbreds at 8-10 weeks. But the findings are in contrast to Sljusar (1966) who observed that crossbreds consumed less feed than purebreds.

Feed Efficiency. Best feed efficiency was observed during 4th week in both the breeds and it was found to be 2.387 and 2.535 in White Cornish and Lyallpur Silver Black respectively. Comparing the two breeds, better feed efficiency was recorded in White Cornish chicks after first week which continued up till the end of experiment. The findings are in line with Koci (1962), Schneider (1963), Solonina and Kopylovskaja (1965) who found that purebreds were more efficient in feed utilization than crossbreds. However, Gintovt *et al.* (1962) concluded that feed efficiency was equal in crossbreds and pure-breds at 90 days of age. Similarly, Siddiqui (1965) found that at 12 weeks both the reciprocal crosses (between *Desi* and White Cornish) and purebred White Cornish were equally efficient in the utilization of feed. The data, when subjected to analysis of variances, revealed highly significant differences between breeds, weeks and interaction between week breeds. Best feed efficiency were observed with White Cornish chicks during 4th, 3rd, 5th and 6th weeks as compared to other weeks but these were non-significant among themselves. The feed efficiency during 1st week was significantly ($P<0.01$) poorer than other weeks. Best feed efficiency in Lyallpur Silver Black chicks was observed

TABLE 1.—*Average Live Weight, Total Feed Consumption and Feed Efficiency of White Cornish and Lyallpur Silver Black Chicks at Different Weeks*

Weeks	Live Weight			Feed Efficiency		Feed Consumption		
	White Cornish	Lyallpur Silver Black	Calculated "t" value	White Cornish	Lyallpur Silver Black	White Cornish	Lyallpur Silver Black	Calculated "t" value
1.	56.66	64.61	5.930**	4.182	4.055	123.71	157.19	1.905 N.S.
2.	107.06	116.70	3.530*	2.925	3.077	232.67	280.16	2.833*
3.	185.76	187.48	0.545NS	2.402	2.725	381.36	441.30	3.270*
4.	287.01	291.97	1.470NS	2.387	2.535	621.56	674.33	2.560*
5.	381.27	388.88	1.214 NS	2.566	2.722	911.02	990.45	2.460*
6.	486.15	488.47	0.259 NS	2.705	2.905	1245.04	1347.31	2.834*
7.	587.46	581.25	0.0005NS	2.960	3.180	1661.28	1768.69	1.700NS
8.	728.98	695.73	1.114NS	2.955	3.350	2075.08	2247.39	1.922NS
9.	830.40	797.08	0.889NS	3.202	3.652.	2572.75	2824.04	1.979NS
10.	911.18	866.53	1.221	3.490	4.057	3088.67	3417.74	1.974NS

* = Significant at 5% level. ** = Significant at 1% level.
NS = Non-significant.

during 4th week followed by 5th, 3rd, and 6th week. Significant differences in feed efficiency were observed during 9th and 1st week as compared with 10th week. Only 3 chicks from Lyallpur Silver Black and 1 White Cornish died in the 1st 3 weeks of the experiment.

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