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COMPARATIVE PRODUCTIVE PERFORMANCE OF INDIGENOUS NAKED NECK AND NAKED NECK CROSSBRED LAYER CHICKENS

Farrukh Saleem*, Babar Hilal Ahmad*, Saleem Zahid*
and Bilal Kabeer*

ABSTRACT:- A study was conducted on comparative productive performance of indigenous Naked Neck (NN) and Naked Neck Crossbred (NNC) i.e., Naked Neck x White Leg Horn at Poultry and Wildlife Programme, National Agricultural Research Centre (NARC), Islamabad, Pakistan. A total of 72 birds (16 weeks of age) comprising 30 females and 6 males of each breed were divided into six experimental units / replicates (10 females and 2 male / replicate). Separate breeding pen were allotted to each replicate. The birds were fed ad-libitum. The data on body weight, feed consumption, daily egg production, egg weight, egg shell thickness and mortality were recorded. Naked Neck Crossbred (NNC) layers exhibited relatively less body weight (1461g) at 40 weeks of age, better egg production (66.36 %) and feed efficiency (761.32 g feed bird^{-1} week^{-1}) and produced heavier eggs (average weight 60.89g) than those produced by Naked Neck (NN). However, the difference in the feed intake values was found to be non <significant (P> 0.05). The Naked Neck layers produced thicker shelled eggs (0.390mm) and showed better livability than their counterparts.

Key Words: Layer Chickens; Breeds; Crossbreds; Body Weight; Feed Intake; Feed Conversion Efficiency; Egg Production; Egg Characteristics; Mortality; Pakistan.

INTRODUCTION

Rural poultry is contributing 23% of total egg production in the country and 9% in meat production in Pakistan (GoP, 1999). The poultry production is playing an important role in supplying eggs and meat to the rapidly growing human population. The indigenous poultry breeds which are being reared in our rural areas are non descriptive and locally called as "Nangi" or "Gut nangi" and have been reported to produce 1.15 kg of meat at five months of age and laying an average of 120 eggs in a year (Ahmad et al., 1973). Ashraf et al. (2003) described the egg producing capacity of indigenous naked neck breed of poultry as 60-70% per year in ideal conditions. In each region of the globe various poultry breeds have been developed to obtain optimum egg and meat production. For high egg and meat production some of the poultry breeds were imported to Pakistan. However, in Pakistan due to different extreme climatic conditions and disease load the survivability of imported poultry breeds is one of the important deterrent factors in the way of developing and popularizing profitable poultry keeping, particularly in rural areas. With

* *Poultry and Wild life Programme, National Agricultural Research Centre, Islamabad, Pakistan.*
Corresponding author: drfarrukhrana@yahoo.com

increasing trend of developing environmentally controlled sheds. The private sector is struggling hard to achieve the production potential according to the international standards.

Among the commercial poultry breeds imported in Pakistan, White Leg Horn (WLH) has gained more appreciation than the others due to its good egg production ability. Moreover, its long stay in Pakistan has made it well adapted to the local environmental condition. Basically, it is a light weight breed of Mediterranean class/breed and is getting more popularity in the rural areas. A Naked Neck crossbred evolved by crossing with the indigenous Naked Neck chickens with the imported breed namely, White Leghorn (WLH).

The objective of this study was to develop and introduce a high egg and meat producing breed which can live as a scavenger bird with good adaptability in local environment and also to study the comparative productive performance of pure indigenous (NN) breed and (NNC).

MATERIALS AND METHOD

The project was executed at Poultry and Wildlife Programme, National Agricultural Research Centre, Islamabad, Pakistan. A total of 72 mature birds (24 weeks of age) comprising 30 females and 6 males of each breed were divided into six experimental units/replicates, having 10 females and 2 males. Each replicate was placed in a separate breeding pen. All birds were leg-banded for identification. The birds were maintained for 20 weeks under similar management conditions like temperature, humidity, ventilation, floor space and light. A commercial layer mash was fed ad libitum to the birds at calculated basis and fresh water was made available to them throughout the experimental period. The data regarding initial and final body weight, feed consumption per bird per week, egg production hen housed and hen day basis, egg weight, egg shell thickness and mortality were recorded. The eggs were weighed individually once a week. The random sampling done fortnightly and two eggs from each group collected till the end of the experiment. In each experimental unit egg production, egg weight, feed consumption and feed efficiency on per bird basis was studied and recorded and then the data was analyzed by applying coefficient of variation technique. Similarly, data on egg shell thickness, initial body weight and final body weight and mortality were also statistically analyzed. The differences between the means were compared by (Sokal and Rholf, 1995).

RESULTS AND DISCUSSION

Body Weight

The average initial body weight of NN breed was 1233.3g and NNC was 1166.13g (Table 1). Whereas, the average final body weight of the NN breed was 1654.87g and NNC was 1461g. Both the breeds were showing an increase in their body weights during the experimental period. But NNC birds showed less increase in weight than those of NN. Similar findings have also been observed by Stino et al. (1982) where NN breed showed higher body weight than other breeds studied. As body weight

Table 1. Overall performance of NN and NN crossbred breeds

Description	NN	NNC	Mean
Initial body weight (g)	1233.30[b]	1166.13[a]	1199.72
Final body weight (g)	1654.87[b]	1461.00[a]	1557.93
Egg production (%) (Hen day basis)	45.30[b]	66.36[a]	55.83
Egg production (%) (Hen housed basis)	39.81[b]	51.22[a]	45.52
Egg No. bird^{-1} week^{-1}	3.17[b]	4.64[a]	3.90
Egg weight (g)	51.80[b]	60.89[a]	56.34
Egg mass (g) bird^{-1} week^{-1}	164.30[b]	482.88[a]	223.59
Feed intake (g) bird^{-1} week^{-1}	773.38[b]	761.32[a]	767.35

Means followed by same letter do not differ significantly at 5% level of probability.

of a bird is affected both by its genetic make up and advancement of age, therefore, increase in body weight may be attributed to genetic potential and advancement in age of the breed (Yaqoob et al., 1965).

Feed Consumption and Efficiency

The minimum feed intake by NN (705.88± 5.53 g) and NNC (713.41±3.67 g) was recorded at week 20 of the experiment. Whereas, maximum feed intake was 772.88± 3.83 and 783.69±4.43g in the respective breeds. The mean values of the feed consumption for NN and NNC were 773.38 and 761.32 bird^{-1}week^{-1}(Table 1). As far the feed conversion ratio per dozen of egg is concerned, it was significantly ($P<0.05$) different among the breeds and weeks exhibited better feed conversion (2068.16) as compared to NN (2925.65). The statistical analysis of the data did not show any difference ($P>0.05$) in the feed consumption values between the breeds (Table 1). Similar trend was observed when the feed conversion ratio was calculated on the basis of egg mass produced by the birds. The results of the present study are partially in line with those observed by Kruegar (1977) who observed better feed efficiency in NNC birds than Fayoumi breed. Poor feed efficiency in NN has also been observed by Ahmad et al. (1973) in comparison with WLH. Better feed efficiency of NNC as regards egg mass production was due to the production of heavier eggs than those of NN. Therefore, efficient utilization of feed by NNC may be attributed to more egg weight and low feed intake than the NN.

Egg Production

Hen day egg production of NNC birds (Table 1) was also higher (66.36 %) than those of NN birds (45.03%). Similar trend was observed when the egg production was calculated on hen-housed basis (51.22% vs 39.81%). The mean egg number bird^{-1} week^{-1} by NN was 3.17 and NNC was 4.64. The statistical analysis of the data showed significant difference between breeds and weeks as well as

their interaction. The data on total egg production indicated that NNC laid significantly (P<0.05) more eggs than NN. The results of the present study agree with the findings of Ashraf et al. (2003), Ahmad et al. (1973) and Bokhari and Chaudhry (1972). The results of the studies conducted by these workers also indicated reduced number of egg laid by NN than the NNC. The higher production in NNC may be due to its superior genetic constitution which had been set up after long services of breeding as compared to NN, which is a dual purpose breed. Therefore, more production of NNC may be attributed to better genetic potential of this breed than that of NN.

Egg Weight

The mean egg weight of NN was 51.80g and NNC was 60.89g. Minimum egg mass (g) produced^{-1} bird^{-1} week^{-1} by NN (103.36±16.41 g) and NNC (117.16±21.30 g) was recorded in the start of the experiment. However, maximum by NN (202.78±21.77 g) and by NNC (323.62±16.37 g) was recorded at 12th and 16th week of the experiment, respectively. As the eggs produced by NNC were heavier than those produced by NN, therefore, obviously egg mass produced bird^{-1} week^{-1} by NNC bird was higher (282.88±6.47 g) than those produced by NN (164.30±4.75 g). The statistical analysis of the data showed a significant difference between breeds as well as weeks. Egg weight of NNC was significantly (P<0.05) higher as compared to NN. The results of the present study are compatible with those observed by Khwaja et al. (2012), Ahmad et al. (1973) and Bokhari and Chaudhry (1972) who observed smaller egg size of NN's than their counterparts. Higher egg weight of NNC birds may be due to their superior genetic make up because of continuous selective breeding produced through a long time. Therefore, heavier egg weight of NN crossbred's than those of NN may be attributed to better genetic potential of this breed.

Egg Shell Thickness

Statistical analysis of the data showed significant (P<0.05) difference between the breeds. NN birds produced thicker shelled egg (0.390 mm) as compared to NNC (0.325 mm). The results of the present study are compatible with those presented by Khwaja et al. (2012) and Ahmad et al. (1973) where NN birds produced thicker shelled eggs than WLH. This difference in egg shell thickness between the two breeds might be due to genetic peculiarities of the two breeds, because the ability to produce eggs is an inherited character. The production of thicker shelled eggs by NN may be attributed to its ability to inherit this character in the progeny. Contrary to findings of the present study, Mahmood et al. (1984) reported non significant difference between NN and Fayoumi breeds which might be due to the difference in the breed compared in this study.

Mortality

The mortality data revealed that there were no significant difference in mortality in both NN and NNC. It may be referred to higher disease resistance and adaptability of NNC in the local climatic conditions. The percent mortality was lower in NN as compared to NNC. These results

agree with the findings of Mahmood et al. (1984), who noticed less mortality in the native breed. Therefore, better survival of NN may be attributed to its adjustment with the local climatic conditions.

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