
EVALUATION OF THE PERFORMANCE TRAITS OF CROSSES OF BROILER CHICKENS AND FULANI ECOTYPE CHICKENS

†Tiamiyu A. K., *†Makanjuola B. A. †Sorunke A. O. and ‡Salako A. E.

†Institute of Agricultural Research and Training,
Obafemi Awolowo University, Moor Plantation, Ibadan

‡University of Ibadan, Ibadan

*Corresponding author's e-mail address: bamakanjuola@gmail.com

ABSTRACT

An experiment was conducted to evaluate the performance of hybrid chickens developed by crossing broiler parent stock and Fulani ecotype chickens. Two hundred (200) 1-day-old chicks were randomly allotted to 5 treatments. Each treatment had 4 replicates and each replicate had 10 birds. The experimental design was Randomised Complete Block Design. The treatments were Treatment 1: Commercial broiler chickens, Treatment 2: Commercial Noiler chickens, Treatment 3: Hybrid chickens developed by crossing broiler cocks with Fulani hens (Hybrid line 1), Treatment 4: Hybrid chickens developed by crossing Fulani cocks with broiler hens (Hybrid line 2) and Treatment 5: Fulani chickens. The experiment had both starter and finisher phases and lasted 10 weeks. The initial weights of the chicken genotypes reflected the sizes of their dam lines and the weights of the eggs they were hatched from. Genotypes with least initial weights had Fulani ecotype hens as their dam lines. The hybrid crosses T3 and T4 had better weight gain and final weights than the Noiler and Fulani ecotypes though lower than the commercial broilers (T1). Efficiency of feed utilisation followed the same trend. The carcass characteristics of the hybrids were also better than that of the Noiler and Fulani ecotypes as they laid more meat on their breasts.

Keywords: Hybrid chickens, Fulani ecotype, noiler, genotype, dam lines

INTRODUCTION

In most countries in Africa, small scale poultry farming by rural households is a cultural norm and over 80% of total poultry production is attributed to family flocks. As at 2018, chicken population in Nigeria was one hundred and eighty million which comprised eighty million chickens raised in extensive systems, sixty million in semi-intensive systems and forty million in intensive systems (FAO 2018). Although the poultry industry has experienced tremendous growth in recent years, the growth has been mostly with exotic chickens. The Nigerian local chickens are still characterised by small body weight, small egg size and few number of eggs (Nwagu and Nwosu, 1994). They however possess some inherent advantages such as good fertility and hatchability, better flavour of meat and eggs, high degree of adaptability to prevailing conditions, high genetic variance in their performance, hardiness, disease tolerance, ease of rearing and the ability to breed naturally (Adeniji *et al.*, 2008). They also have great potential for genetic improvement through breeding programmes such as selection and/or crossbreeding (Adebambo *et al.*, 2009). There is thus the need to step up productivity of the Nigerian local chicken in order to provide more meat and eggs.

Some popular locally adapted chickens in Nigeria include the Fulani ecotype, the Yoruba ecotype and other ecotypes from the southeastern states of Nigeria (Ajayi, 2010). The Fulani ecotype chickens have been reported to possess intrinsic growth potentials that can be tapped in commercial chicken production (Fayeye *et al.*, 2005). The present study evaluated the performance of two crosses of the Fulani ecotype chicken and broiler chickens to estimate their potentials as candidates for the development of meat type indigenous chickens.

MATERIALS AND METHODS

A total of two hundred (200) 1-day-old chicks were randomly allotted to 5 treatments. Each treatment had 4 replicates and each replicate had 10 birds. The treatments are listed as follows:

Treatment 1: Commercial broiler chickens

Treatment 2: Commercial noiler chickens

Treatment 3: Hybrid Line 1 (broiler cocks X Fulani hens) {BF}

Treatment 4: Hybrid Line 2 (Fulani cocks X broiler hens) {FB}

Treatment 5: Fulani chickens

Birds were tagged and weighed individually on the first day before they were randomly allotted to treatments and replicates. They were subsequently weighed on a weekly basis. The birds were reared in a well ventilated and illuminated poultry house on deep litter. Routine management procedures were followed while fresh commercial broiler feed was supplied *ad libitum* and the birds had access to cool clean water throughout the duration of the study. The experiment had both starter and finisher phases and lasted 10 weeks. Feed intake, body weight gain and feed conversion ratio were calculated. At the end of the feeding trial, 2 birds were randomly selected from each replicate for carcass trait evaluation. Feed was withdrawn overnight before slaughter. Each bird was exsanguinated by cutting the jugular vein and allowed to bleed for approximately 2 minutes. The weights of breast, drumsticks, thighs, wings were taken. Relative weights were then calculated as percentages of live body weight and the average values of the 2 birds picked per replicate was used for analysis of variance.

RESULTS AND DISCUSSION

Results of the performance traits of the birds are shown in Figures 1, 2 and 3. The initial weight of birds on Treatment 4 was significantly higher than those of birds on the other treatments while the final weight of birds on Treatment 1 was significantly ($p < 0.05$) higher than those on the other treatments. The trend in Figure 1 suggests the influence of maternal effect as chicks derived from broiler parent hens had comparative advantage over those from the indigenous female line due to the initial superiority of bigger eggs laid by broiler breeder hens. Day-old chick weight is a function of breeder hen egg weight. As regards the final weight, the pure broiler genotype (Treatment 1) had significantly ($P < 0.05$) higher weight of all the genotypes followed by birds on Treatment 3 and Treatment 4. These crossbreds were also significantly ($P < 0.05$) heavier than the indigenous chickens (Treatment 5) and Noilers (Treatment 2). Feed conversion ratio of birds on Treatment 1 was lowest while birds on Treatment 5 had the highest value. The hybrids were better converters of feed (Treatments 3 and 4) compared to birds on Treatments 2 and 5. This agrees with the findings of Rendel and Mapple (1986). The authors reported that heavy breeds and large birds consume more feed and have lower feed conversion ratio while small and light-bodied hens have higher feed conversion ratio despite a relatively lower carcass value.

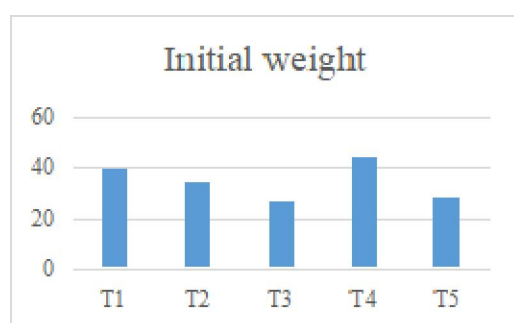


Fig 1: Initial weights of crosses of chickens broiler chickens and Fulani ecotype chickens

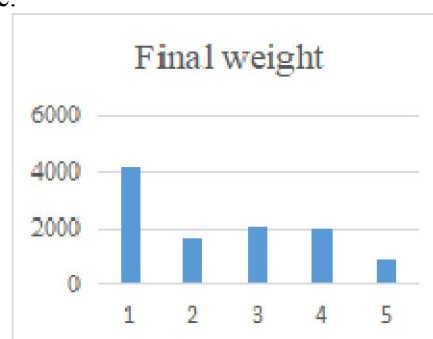


Fig 2: Final weights of crosses of broiler and Fulani ecotype chickens

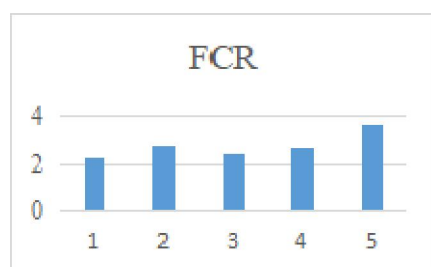


Fig 3: Feed conversion ratios of crosses of broiler chickens and Fulani ecotype chickens

Results of carcass traits (breast and drumsticks) are shown in Figures 4 and 5. Breast weight of birds on Treatment 1 was significantly ($p < 0.05$) higher than those of birds on the other treatments with birds on Treatment 5 having the lowest breast weight. It is of note that the F1 hybrids laid more

muscle on the breast than the indigenous ecotype and commercial Noiler. This was a significant improvement of an important trait of meat type birds. Drumstick weight of birds on Treatment 4 was significantly ($p < 0.05$) higher than those of birds on the other treatments while birds on Treatment 5 had the lowest drumstick weight.

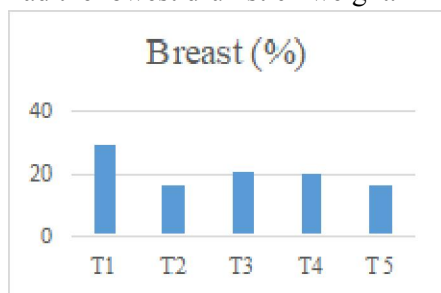


Fig 4: Breast weights of crosses of broiler broiler chickens and Fulani ecotype chickens

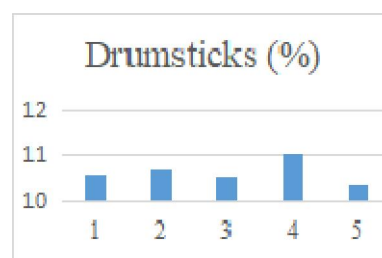


Fig 5: Drumstick weights of crosses of chickens and Fulani ecotype

CONCLUSION

Due to the better slaughter weight, feed conversion ratio and carcass traits of F1 hybrids of Fulani ecotype and broiler chickens over the indigenous Fulani ecotype chickens and commercial Noiler chickens, the crosses had exhibited potentials as candidates for the development of indigenous meat type chicken.

REFERENCES

- Adebambo, O. A., Ikeobi, C. O. N., Ozoje, M. O. and Adebambo, O. A. (2009). Variation in growth performance of pure and crossbred meat type chickens. *Nigerian Journal of Animal Production*, 36 (2): 211- 227.
- Adedeji, T. A., Ojedapo, L. O., Ige A. O., Ameen S. A., Akinwumi, A. O. and Amao S. R. (2008). Genetic evaluation of growth performance of pure and crossbred chicken progenies in a derived savannah environment. In: Proceedings of the 13th Annual Conference of Animal Science Association of Nigeria, September 15-19, Ahmadu Bello University, Zaria, Kaduna State. Pp. 8 - 12.
- Ajayi, F. O. (2010). Nigerian Indigenous Chicken: A Valuable Genetic Resource for Meat And Egg Production. *Asian Journal of Poultry Science*, 4 (4):164 – 172.
- Fayeye, T. R., Adeshiyan, A. B. and Olugbami, A. A. (2005). Egg traits, hatchability and early growth performance of the Fulani ecotype chickens. *Livestock Research for Rural Development*, 17(7).
- Food and Agricultural Organization (2018). Africa Sustainable Livestock 2050: Livestock and livelihoods spotlight. Nigeria Cattle and Poultry Sectors.
- Nwagu, B. I. and Nwosu, C. C. (1994). Growth performance of F₁ crosses between Arbor Acres broilers and local chicken of Nigeria. *Indian Journal of Animal Science*, 64(6): 651 – 653.
- Rendel, J. A. and Mapple, J. (1986). Body composition and physical parameters as determinants of age at sexual maturity and performance efficiency in dwarf hens divergently selected for body weight. *Poultry Science Journal*, 65 (8): 1429 - 1436.