EVALUATION OF THE NIGERIAN INDIGENOUS FOWL

Evaluation de la poule indigène de Nigeria

Valoración de la gallina indígena de Nigeria

J. A. OLUYEMI *
V. A. OYENUGA *

Introduction

No comprehensive evaluation of the Nigerian indigenous fowl has previously been undertaken. According to Hill (1954) the mature weights of the male and of the female Nigerian indigenous fowl are 1-3 lb (0.45-1.35 Kg) and 1 ½-4 lb (0.68-1.71 Kg) respectively. The fowl produces 40-80 eggs per annum each, weighin 1-1 ¼ oz (28.3-35.4 g). The fowl is hardy and a good forager.

If suitable, the indigenous fowl in Nigeria, as in some many other parts of the world, should be used as materials for the execution of local poultry breeding projects especially if these are impeded by the scarcity of parent stock. The object of this study is to critically assess the potentiality of the Nigerian indigenous fowl as broilers as the first step towards its classification as a light or a heavy breed, the two main groupings of the developed breeds.

Materials and methods

The experimental birds consisted initially of the Nigerian indigenous fowl, White Rock, Rhode Island Red and White Leghorn. The indigenous fowl were 1171 males and 1210 females at different stages of growth, representing a random sample.

The birds were intensively reared in open sided buildings. The chick, grower and breeders diets contained respectively 24.5 %, 20.3 % and 17.2 % determined protein ($N \times 6.25$) and feeding was *ad libitum*.

* Department of Animal Science, Faculty of Agriculture, University of Ibadan, Nigeria.

TABLE 1

VARIANCE ANALYSIS FOR THE DETERMINATION OF THE HERITABILITY ESTIMATES OF THE 12 WEEK BODY WEIGHT OF THE NIGERIAN INDIGENOUS FOLWL

Sources of variation	Degrees of freedom	Variance components sire or dam		Heritability estimates	
Hatches	2				
Sire with in batches	48	σ_s^2	1088.4	h^2s	$= 0.321 \pm 0.008$
Dames with in sires	105	σ_D^2	996.8	h^2d	$= 0.293 \pm 0.004$
Full sibs within hatches	244	$\sigma^2 (D + s)$	2084.2	$h^2 (s+d)$	$= 0.307 \pm 0.007$

In the first experiment, 50 male and 50 female indigenous fowl and of each of the improved breeds were reared from day old to 20 weeks of age, and the growth patterns, on the basis of biweekly body weights, of the birds were compared by variance analyses.

In the second experiment the twelve-week body weights of male and female indigenous fowl, obtained in closely spaced three hatches, were analysed by sib-analysis in accordance with KING and HENDERSON (1954). This was to determine the heritability estimate of the twelve week body weight of the fowl.

In the third experiment, using the F_1 of the purchased indigenous fowl as the base population, the fowl was selected for 12 week body weight for two generations. Selection response was the deviation in performance of the selected from the randombred control populations.

RESULTS AND DISCUSSION

The indigenous fowl appears different in growth pattern from the improved breeds. Whereas the indigenous fowl was not significantly ($P > 0.05$) different in body weight from White Leghorn from day old to two weeks and again at 20 weeks of age, it was significantly ($P > 0.05$) heavier than this breed from 4 to 18 weeks of age. It was not significantly ($P > 0.05$) different from Rhode Island Red only at 10 weeks of age while at other ages it weighed significantly ($P > 0.05$) less.

TABLE 2

EXPECTED AND OBTAINED RESPONSES TO SELECTION FOR 12 WEEK BODY WEIGHT OF THE NIGERIAN INDIGENOUS FOWL

Generation	Male			Female		
	Expected	Obtained		Expected	Obtained	
		Actual (g)	As % of weight		Actual (g)	As % of weight
1	37.8	32.4	8.4	33.3	26.4	8.0
2	26.0 (63.8)	23.6 (55.9)	6.6 (14.3)	26.0 (59.3)	21.1 (47.5)	6.4 14.4

TABLE 3

REALISED VERUS EXPECTED SELECTION DIFFERENTIALS

Generation	Sex	Selection differential (g)	
		Expected	Realised
1	Male	126.0	107.7
	Female	110.8	88.0
2	Male	86.7	78.7
	Female	86.7	70.3

That is, the indigenous fowl exhibited a growth pattern that favoured the broiler rather than the mature body weight, which is economically desirable in broiler breeders (TIMMONS, 1971). However, the heritability estimates of the 12 week body weight of the fowl appear moderate (Table 1). These are $h^2s = 0.301 \pm 0.008$, $h^2d = 0.293 \pm 0.004$ and $h^2(s + d) = 0.307 \pm 0.007$, indicating that the broiler weight can little be improved.

Consistent with this evidence, the body weight response tended to be low. These were 32.3 g and 26.4 g in the first generation, 23.6 g and 21.1 g in the second generation while the cumulative weight responses were 55.9 g and 47.5 g for the male and the female respectively (Table 2). However, in terms of percentage body weights, these responses were moderately high, indicating that the small body size of the fowl was itself a limiting factor to selection response.

Moreover, the lower realised than expected selection intensity (Table 3) arose from the low egg production of the birds. The low egg production of the birds necessitated a relaxation in selection intensity and partly accounted for the lower weight gain in the second than in the first generation. To maintain the initially high selection intensity would hasten the attainment of genetic plateau in the flock, without substantial improvement in broiler weight.

It seems therefore that it is unlikely that the Nigerian indigenous fowl can be developed to a heavy breed. The potentiality of the bird as a layer should therefore be assessed adopting the same basic procedure as in this study.

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