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## Comparative Study of the Performance of Breeds of Layers in Sub Sahara Region of Africa

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**Abstract:** The study was conducted to compare the performance of breeds of layers reared in Ogun State, with the view to identify the breeds of layers that perform well and to determine certain factors that can hinder the performance of layers. The state was divided into four divisions namely: Egba, Yewa/Awori, Ijebu and Remo. The information was collected by the use of structured questionnaire. These questionnaires were distributed to 120 farms in the state. i.e 30 questionnaires for each division. The data collected were analyzed using simple descriptive statistic and analysis of variance. The descriptive statistic shows certain factors that can affect the performance of layers. On the performance of breeds of layers, the result shows that there is high significant difference ( $P < 0.01$ ) in the performance of breeds of layers in term of tolerant to heat stress, resistance to disease and production of more egg with less feed consumption. Also brown leghorn breed of layers was observed to be widely used by farmers across the state because of its higher performance compared to all other breeds reared in the state.

**Key words:** Performance, breeds and layers, brown leghorn breed

### INTRODUCTION

Layers are bred primarily for egg production. Layers are lighter than chicken bred to produce meat because they are smaller, they need less feed to maintain their body weight while laying. The Mediterranean breeds of layers like leghorn, Ancona and the Minorca are prolific egg producing layers. The light breeds of layers are excellent egg producers and rarely become broody (Komolafe *et al.*, 1980). They are used extensively as layers in west Africa (Komolafe *et al.*, 1980). Their carcass value after production is very small. However, since they have smaller bodies, they usually require much less food for each dozen of eggs produced than the heavier dual-purpose breeds (Komolafe *et al.*, 1980). The light breeds of layers mature earlier, than heavier breeds (Komolafe *et al.*, 1980).

It is possible to run a profitable and successful commercial egg productions in Nigeria if good management practices and all the scientific know ledge available from the research done in this country are applied. Attention must be paid to every detail concerning health, housing and feeding and disease prevention of the layers in order to achieve maximum performance of the layers. The problem of malnutrition has assumed greater dimension in this country due to low animal protein intake. This problem has been the persistent causes of malnutrition. In order to solve this problem, poultry eggs are recognize as the source of protein and vitamins.

The registration of the shika brown parent stock layers by the Product Research Institute Shika, in early 2000 to

produce table egg has been recognize to solve protein in crisis in the country. Egg production is therefore not foreign to Nigeria. It has attained prominent stage in this state primarily due to its short generation interval and relative quick turn over on investment and high quality protein. There has been an obvious decrease in the number of individual engaged in production of eggs in the past. But today, egg production has become important as it constitute a source of income to the farmers. The quick rate at which layers grow to maturity for the production of table egg makes a strong promise of reducing the protein shortage in the diet of Nigerians. For provision of sufficient animal protein for the nation, there is need to embark on appropriate and efficient layers management. The role of egg in the human body is much more essential and elaborate that it is recommended by F.A.O (Food and Agriculture Organization) for each person to be consuming an egg in a day. Egg contains energy giving materials such as fats and carbohydrate and protein, which repair worn out cell of the body. (Akinwande, 1990).

Mostly, the nutritionist have found that a man needs about 50% or more different nutrient for maintaining good health, out of which eggs have been found to contain over 4% of these nutrients (James, 1985). This shows that egg is very important to man's health and body development. The demand for egg is relatively higher than its supply.

Therefore, egg production must increase its supply and to achieve this, a sound and efficient of layers management and breed is needed.

**Objectives of the study:** The general objectives of this study are to make a comparison of the performance of breeds of layers. The specific objectives are to:

1. Identify the breeds of layers that perform optimum.
2. To identify certain factors that can hinder their performance.
3. To make a recommendation based on the finding of the study.

**Statement of the problem:** This study is under taken in order to look into the following problems with the view of providing solutions to them.

1. To what extent is the inadequate of management affecting the performance of layers?
2. Is there any differences in the performance of the various breeds of layers?

**Research hypothesis:** The null ( $H_0$ ) and alternate ( $H_1$ ) hypothesis were addressed for the purpose of this study.

$H_0$ : There is no significant difference in the performance of breeds of layers.

$H_1$ : There is a significant difference in the performance of layers

**Significance of the study:** The finding of this research will be of immense benefits to poultry farmers and agriculturist who would be better informed on the performance of breeds of layers. Summarily, the outcome of this research aim at:

1. Enlighten the farmers to know the breeds of layers that perform well.
2. It will also help the farmers to avoid mistakes in choosing breeds of layers.
3. It also educates the people to know some of the factors that can affect the performance of layers and how to prevent it.

## MATERIALS AND METHODS

**The study area:** Ogun state is bounded in the West by Republic of Benin, in the South by Lagos state and in the North by Oyo state. This state has twenty local Government areas. It was divided in to four divisions for the purpose of this study. Namely: Egba, Yewa/Awori, Ijebu and Remo divisions.

**Sampling technique:** The stratified random sampling technique was used for the selection of poultry farms in the state. The four divisions were recognized as strata and 120 farms were randomly selected from the strata. And 30 questionnaires were distributed to each division for collection of information.

**Data collection:** The data were collected through the use of structured questionnaire. The questionnaires were personally administered by the investigator. The farmers were visited by the researcher who explained the

importance of the study to them and gave them the assurance of confidentiality. The study was design to look into the performance of breeds of layers under which the following information were collected. Housing pattern, level of management, breeds of layers reared, health management, source of feed and the number of egg lay per bird per annum.

**Analysis of data:** The data collected through the questionnaire were analyzed using the simple descriptive statistic technique which is frequency percentages and analysis of variance (ANOVA). The analysis of variance was done by the computer analyst and it was used to test for the hypothesis.

**Limitation of data:** Despite the efforts made to collect very accurate data for the study, a number of difficulties were still encountered. One of such difficulties is the fact that some of the farmers thought the study was for the tax assessment and such were reluctant to provide information especially on the number of crate. Of egg collected daily. Also, lack of record keeping on mortality rate of each breed was a source of bias in this study. Also the majority of the farmers can not determined the average number of egg lay per each breeds of layers in a year. These difficulties among others inform rejection of some questionnaire in the process of data.

## RESULTS AND DISCUSSION

Table 1 shows that 98.33% of the farmers were men while 1.67% was female. It is then suspected that majority of the female in the state are not directly involved in poultry farming. If they are involved, their involvement may be in the process of marketing egg.

Table 2 shows that 8.33% of the farmers had primary School Certificate, 25% of the farmers had Secondary School Certificate, while 66.67% of the farmers had higher education. This kind of frequency distribution allows for easy adoption of innovation by the farmers in the state. Since majority of them are literate, their reactions towards acceptance or adoption of scientific techniques to improve their poultry farm will be generally high and this will increase their output.

It can be seen from the Table 3 that none of the farm sampled practice extensive and semi-intensive system of rearing. All the farmers used intensive system of rearing. Among these set of farmer, only 5 (4.17%) of them combined battery cage system with deep litters. According to Komolafe *et al.* (1980) layers are unlikely to perform well in deep litter because there is possibility that the ammonia produced from their droppings inside the house may affect the birds' health and thus harm their growth and egg production. Oluyemi and Robert (1984) Also reported that layers are unlikely to perform satisfactory if the housing or system of management is poor.

Table 1: Frequency distribution of the farmer by sex

Sex	Frequency	Percentage %
Male	118	98.33
Female	2	1.67
Total	120	100.00

Source: Field Survey, 2006.

Table 2: Education status of farmers

Education Status	Frequency	Percentages %
No Schooling	0	0.00
Primary School Certificate	10	8.33
Secondary School Certificate	30	25.00
Higher Education	80	66.67
Total	120	100.00

Source: Field Survey, 2006.

Table 3: System of management practice by the farmers

System of Rearing	Frequency	Percentages %
Extensive system	0	0
Intensive system	120	100
Semi-intensive system	0	0
Total	120	100

Source: Field Survey, 2006.

Table 4: Mortality of the layers per annum

Mortality	Frequency	Percentages %
2-5%	30	25.00
5-10%	60	50.00
10-20%	20	16.67
Can't really say	10	8.33
Total	120	100.00

Source: Field Survey, 2006.

Table 5: Disease out break on the farm

Types of disease	Frequency	Percentages %
New castle	76	63.33
Coccidiosis	24	20.00
Fowl pox	15	12.50
Gumboro	5	4.17
Total	120	100.00

Source: Field Survey, 2006.

Table 6: Source of feed

Source of feed	Frequency	Percentage %
Self formulation	20	16.67
Purchase feed from manufacturer	70	58.33
Purchase and self formulate the feed	30	25.00
Total	120	100.0

Source: Field Survey, 2006.

Table 7: Breeds of layers in stock

Types of breed	Frequency	Percentage %
Brown leghorn	80	66.67
White leghorn	-	-
Olympia black	6	5.00
Brown leghorn and Olympia black	34	28.33
Total	120	100.00

Source: Field Survey, 2006.

Table 4 implies that 25% of the farmers had 2-5% of mortality per annum, 50% of the farmers had 5-10% of mortality rate per annum and 16.67% of the farmers had 10-20% of mortality per annum while 8.33% of the farmers do not know their mortality rate per annum. This may be due to lack of proper record. According to Olowe (1991) flock mortality is one of the most important factors affecting profit from egg business. Since every bird that dies constitute direct and indirect loss in term of its initial costs, cost of feeding and cost of labour and maintenance in keeping it up till the time of death.

Table 5 shows that 63.33% of the farmers had experienced new castle disease on their farm, 20% of the farmer had experienced Coccidiosis disease on their farm, 12.5% of the farmer had experienced fowl pox disease on their farm while only 4.17% of the farm had experienced Gumboro disease on their farm. Hence, the layers suffering from these diseases may definitely perform poorly, which might lead to the fall in egg yield and quality. According to Oyejide, (1986) Diseases constitute one of the most drastic limitations to the production of the layers. He further said that diseases out break are combated through good management practices, vaccination, and preventive and curative animal health programme. Kekeocha, (1984) also observed that an effective control of diseases and parasite constitute one of the most essential requirement for stock health.

It can be seen from Table 6 that 16.67% of the farmers compounded their feed, 58.33% of the farmers purchased their feed from manufacturer while 25% of the farmers purchased and compounded their feed. This indicate that majority of the farmers purchased the feed from manufacturer. Among the farmers that purchase feed from manufacturers, majority of them purchased feed from different source. Hence, this may affect the performance of layers. And if there is a problem in the flock, they would not be able to trace the source of the problem.

Table 7 shows that 66.67% of the farmers had brown leghorn layer in their stock, 5% of the farmers had Olympia black, while 28.33% .of the farmers had both Olympia black and brown leghorn in their stock. This indicated that brown leghorn layers .is the most widely used breed in Ogun state. The farmers interviewed reported that brown leghorn layers perform well than other breeds and it lays large brown egg. Those farmers combining brown leghorn and Olympia black reported that Olympia black have high-resale value after productive period. According to Komolafe *et al.* (1980) ability of layers to lay a large number of eggs of uniform colour, shell qualities and capable of living for a long time with low cost of maintenance and production must be considered in choosing breeds of layers.

The value of F according to our calculation is 19.96. This exist the critical value of 10.92 at degree of freedom of 2

Table 8: Other performance results of the breeds of layers

Performance	Breeds of Layers		
	Brown Leghorn	Olympia Black	Brown Leghorn and Olympia Black
Produce more egg with less feed consumption	110	-	10
Resistance to disease	70	16	34
Tolerance to heat stress	100	-	20

Ho: There is no significant different in the performance of breeds of layers

H1: There is significant difference in the performance of breeds of layers

Table 9: Using reliability analysis of variance with computerised statistical package

SV	SS	DF	MS	f
Between-group	0.2222	2	0.1111	**19.96
Within-group	14353.3333	6	2392.2222	-
Between measures	13046.2222	2	6523.1111	-
Residual	1307.1111	4	326.7778	-
Total	14353.5556	8	1794.1944	-

Grand mean = 40.2222. Degree of freedom. Numerator = 2.

Denominator = 6. F<sub>cal</sub> = 19.96. F<sub>tab</sub> at (P < 0.01) = 10.92,

(F<sub>tab</sub> at P < 0.05) = 5.14. F<sub>cal</sub> > F<sub>tab</sub> reject null hypothesis (Ho) and accept (H1) hypothesis. SF: Source of variation. SS: Sum of Square. DF: Degree of Freedom. MS: Mean Square.

and 6 with 0.01 level of significant. Thus we say with relevance to disease, tolerant to heat stress and production of more eggs with less feed consumption, there is high significant difference (P < 0.01) in the performance of layers.

**Summary:** The descriptive statistic shows that majority of the poultry farmers in Ogun state are male and most of them were literate. This can make an adoption of innovation on improvement of the farm easier. Large scale and medium scale farms were noticed in this finding than small scale poultry farming. This can bring about reduction in protein shortage in the diet of people in Ogun State. Majority .of the farmers had experienced disease outbreak on their farm at one time or the other, which led to reduction in egg production and folding up of some farm in the state. Certain factor has being identified as the factors that can affect the performance of layers. Such factors include: Inadequate management, disease outbreak on the farm, high mortality, lack of expertise by the poultry attendants and insufficient of feed.

The result of the findings shows that brown leghorn layers are the most popular breeds reared by the farmers in Ogun State. Most of the farmers interviewed reported that this breed produced large brown egg with uniform colour, resistance to disease and produce more egg with less feed consumption. About 28.33% of the farmers combined brown leghorn with Olympia black on their farm. These group of farmer reported that brown leghorn produced egg than Olympia black, but Olympia black have high-resale value after their productive

period. This can serve as a source of income for the farmers after laying period. The farmers interviewed also reported that white leghorn layers also possesses the qualities of brown leghorn, but due to the fact that this breed lays white egg and the demand for white egg is low in Ogun State. It makes the breed unimportant among farmers in Ogun State.

**Recommendation:** On the basis of the findings of the study, the following recommendations are offered.

To accomplish the objectives of bridging the animal protein deficiency in the diet of the citizen, the government should make medium loan term at low interest rate available to poultry farmers, so that they can expand their farm.

In order to curtail the adulteration of the raw materials especially feeds which invariably leads to higher production cost, there is need for government to give loan to the poultry farmers to establish their own feed mill.

Farmers should be educated on the optimum farm size they can efficiently handle for maximum profit at least cost.

For optimum egg production on the farm and ability to lay large number of egg with uniform colour, brown leghorn layers is recommended as the best breed of layers in the State.

For the farmers to benefit from a good egg production as well as a high-resale value for the birds after productive period, brown leghorn and Olympia black layers may be combined in the flock.

For healthy production and reduce mortality to be achieved, farmers should put together all the management practices such as vaccination, feeding and other daily routing practices,

**Conclusion:** The efficiency with which the poultry industries ameliorate protein deficiency especially through eggs depends on the performance of layers and the management. The present study has identify certain factors that can hinder or affect the performance .of breeds of layers and the ways of ameliorate it so as to reduce protein deficiency in the state. It was observed that not only breeds of layers can determined their performance, but also effect of management can also affect the performance of layers. In order to ensure good performance of the bird's farmers should choose breeds of layers that can perform well in term of egg production, resistance to disease and production of large egg with uniform colour. They should also put together all the management practices that are necessary on the farm to maximize the profit and minimized the cost.

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