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Mortality Rate at the Brooding Stage of Various Broiler Breeds Reared in Sub Sahara Region of West Africa

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Abstract: The study was based on morality rate at the brooding stage of various broiler breeds reared in Ogun State, Nigeria. The state was divided into four provinces namely Egba, Egbado, Ijebu and Remo Division. The data were collected through the use of questionnaires, 30 questionnaires were administered in each province making 120 Questionnaires in all. The collective data were analyzed with the use of simple percentage, analysis of variance and other statistic techniques. The result shows that there is significant different ($p<0.001$) in the mortality rate of various broilers breeds during brooding stage with Ross breed having the lowest mortality record, the result also reveal that the major causes of mortality of birds is poor management of the farm, poor feed and feeding, unhygienic environment etc. and the best breed of broiler that is resistance to diseases is Ross breeds of broiler.

Key words: Mortality rate, brooding, broiler, breeds

INTRODUCTION

Agriculture is one of the oldest industries in Nigeria as old as man. According in Abimbola *et al.* (2001) Agriculture is the art and science of cultivating the soil, producing livestock, preparing livestock products for man's consumption and the process of selling excess produce and livestock. Modern agriculture in Nigeria came into existence by early men that came in contact with both plants and animals; The main objective of agriculture is to find solution to the poverty level of people in terms of food production Abimbola *et al.* (2001). The production of food by agriculture to people will increase and eradicate poverty level among Nigeria people; also increase economy of the nation and contribute to the health care of man (Adegbola *et al.*, 1980). Food is anything that people eat to sustain their health. It provides energy for man so as to be able to have power to do things or to work, it promotes their good standard of living it contribute to the growth and development of man and a shortage of it contributes to the development of hunger which can then leads to death (Adegbola *et al.*, 1980). Adequate food supply should be taken by man i.e., balanced diet (Adegbola *et al.*, 1980). The following are the food nutrients: Carbohydrate, protein, fats and oil, vitamins, minerals and water for the digestion of food. Out of these, the main nutrient required for body building is protein (Adegbola *et al.*, 1980).

Protein is highly essential and it can be derived from both plants and animals of specific varieties, out of all the known sources of protein to man, the most recognized one is that of animal source and it include poultry, pig, fish, rabbit. Inadequacy of protein can leads to reproductive failures, slow growth rate, malfunctioning of enzymes, blood and hormones formation (Ogieva, 2003). Poultry is often preferred to all others because of its dual importance which include production of meat and egg needed for protein. Poultry refers to group of domesticated birds kept for meat and egg production and other purposes i.e., broilers and layers. These include: domesticated fowls, turkey, goose, duck, quail and pigeons. Broiler is one of the world's major and fastest growing sources of meat, it is also predominant among livestock production in Nigeria. Broiler production is an important part of farming which serves as an additional occupation to supplement the country's marginal and small income earners. In the past, broiler production was regarded as a sub occupation and the production was based on local breeds of fowl. Domesticated fowl i.e chicken is the most popular among others due to its short generation interval and their capacity in laying eggs and meat production. Broiler is one of the domesticated birds reared for meat; it is very nutritious and proteineous. Broilers are mainly kept for their meat but their eggs are mostly reserved for natural incubation by the hen or with the use of machine for the hatching of eggs to produce young ones. Broilers meat cannot be overlooked because of its high protein content which contributes to the good health care of man.

In Nigeria, broiler productions are largely kept under the extensive management but during brooding stage, it is under the intensive management. According to Falaye (2000) broiler are important in providing a valuable source of protein in form of meat. Broilers should be well fed for better production and to serve its purpose in term of supplying protein to man. William and Payne (1988) said that malnutrition is a great problem in rearing

broiler throughout the whole world because it reduces flock resistance to disease. There is a great reduction in their feed intake as a result of high temperature. The production performance of the broiler is determined by the feed intake, nutrients and the ability of birds to utilize the feed effectively for better production. There are various types of broiler breeds used in the production and these include Cornish, Anak, 2000, Arbouracre, Indian River, Ross, Plymouth Rock, Barred Rock, Rhode Island Red etc.

Therefore, the increase in the production of broiler is highly essential due to the fact that it supply an important nutrients in man's diet i.e., protein required for body building.

Objective of the study: The main objective of this research work is to examine the mortality rate at the brooding stage of various broiler breeds reared in Ogun State. The above objective could only be achieved by testing the hypothesis stated below.

Hypothesis of the study: The understated null (H0) hypothesis will be tested for the purpose of achieving the objective of this study.

H0: There is no significant difference in the mortality rate of various broiler breeds during brooding stage.
H1: There is significant difference in the mortality rate of various broiler breeds during brooding stage.

Significance of the study: This research will be of great advantage to poultry farmers generally to enhance their production after which reasonable recommendation would be made on the mortality rate and causative agent of various broiler breeds. The result of this findings aims at;

- Getting the accurate records of mortality rate of various broiler breeds and causes
- Identifying the breed of broiler with lowest mortality
- Providing necessary possible solutions
- Enlightening the farmers on how to maintain their production with low mortality rate of birds

Justification of the study: In broiler production, there are lots of problems that contribute to the malfunctioning of birds; such problems include poor feeding rate, poor environmental condition, wet litter management etc. which later leads to diseases as well as death of the birds. One of the problem that affect broiler birds is high mortality rate and could be caused by poor management of the farm, poor feed intake etc. feeding is highly essential in the poultry production, birds should be well fed with nutritious feed, good health care and management to reduce the mortality rate and for better production.

Limitations of the study: The research will be based on various broiler breeds reared in Ogun State alone, so the findings may not be generalized for the whole nation.

MATERIALS AND METHODS

Ogun State was created in February 3rd 1976 out of the former Western State of Nigeria. Ogun State is in the South West Nigeria, it is bounded to the West by Benin Republic, East by Ondo State and to the North by Oyo State and Osun State. Ogun State is inhabited mainly by Yoruba speaking people but with sub groups from other part of the country. Agriculture is the major occupation of the people of Ogun State, it has 20 local government area; Ogun State was divided into 4 province purposely because of this research namely; Egba, Egbado, Ijebu and Remo divisions. The method by which data were collected was through the use of questionnaire, data collected were also analyzed statistically in this chapter.

Sampling techniques: The respondent were randomly and statistically sampled from the whole population of farms established in Ogun State whereby each province was given 30 questionnaire making 120 questionnaire in all.

Data collection: The study was conducted in Ogun State and was critically carried out to find solution to the mortality rate of various broiler breeds during brooding stage in order to increase farmer's income.

The data were collected through the use of questionnaires which were interpreted to the farmers by the researcher thorough explanations. Also, in order to derive more information's for the completion of this research work, past projects, text books and internet service were used because the research study was carried out in order to look into the causes of mortality rate of various broiler breeds during brooding stage and how to control the effects, so as to increase broiler production and farmers income and also to determined which of the breeds used in Ogun State as more resistant to disease.

Problems of data collection: In the collection of data, there are lots of problems that face farmers as well as researchers which serve as data collection limitations. Finance is one of the problems faced by researchers in term of transportation fee through out the four divisions for the collection of data, farmers illiteracy also is another problem entirely because it is not possible to get accurate report from illiterate farmers due to their illiteracy. Also, language barrier, norms and beliefs of farmers on what they are doing and what they received because most farmers do not give correct information about certain questions being asked from them due to their belief, even interpreter is needed for the dissemination of information in their own language.

Lack of farmers co-operation with researchers, most farmers were not co-operating with the researchers a times they gave wrong information about their farm. Therefore, in carrying out research study like this, it is not possible to get accurate result for the study.

Data analysis: Analysis of variance, simple percentage and other statistic techniques were used for the data analysis which were analyzed by computer analyst.

RESULTS AND DISCUSSION

The Table 1 shows the sex of the farmers. The report from the finding proved that majority of the farmers were male i.e 74.2% (89) while females were 25.8% (31). This indicate that most people in Ogun State particularly in the area of study that engaged in broiler production were male. According to Classen and Bedford (1999) different people or scholars sees broiler production that needs to be handled with seriousness by every man or every human being.

In the Table 2, educational qualification of farmers in the area of study are presented. None of the farmers had no formal education, 3.3% of the farmers had primary school certificate, 17.5% of the broiler production farmers had secondary school certificate while 79.2% of the farmers had higher education. This indicates that most of the farmers are well educated and none of them is illiterate thereby the rate of disseminating new ideas to farmers will be easy and direct. According to Oluyemi and Robert (1999) broiler producers need to apply necessary management skills for positive production.

From the Table 3, none of the farmers practiced extensive system of management, 7.5% only practiced semi intensive system of management and 92.5% reared their broiler under intensive system of rearing which are mainly deep litters. This indicates that during brooding stage, broilers can only be reared under intensive of management. According to Oluyemi and Robbert (1999) broiler production are largely kept under the intensive management during brooding stage. He further said that housing is very important in the production of broiler in order to provide environmental condition that will enhance maximum production because poor management leads to poor production in broiler.

Table 4 shows the rate of mortality on farm. It can be seen that 83.3% of the farmers recorded high mortality rate on their farm while 16.7% had low mortality rate of birds. This indicates that the management of broiler farm determines the mortality rate of birds on each farm. Poor management of the farm leads to death of birds and this will affect the production, performer. This trend was similar to what obtained by management of broiler requires perfect health care, in terms of feeders, drinkers, litters etc. in order to prevent the birds from containing any disease.

Table 1: Frequency distribution of earmers by sex

Sex	Frequency	Percentage (%)
Male	89	74.2
Female	31	25.8
Total	120	100.0

Sources: Field Survey, 2007

Table 2: Level of farmers education

Educational Status	Frequency	Percentage (%)
No formal education	0	0.0
Primary school certificate	4	3.3
Secondary school certificate	21	17.5
Higher education	95	79.2
Total	120	100.0

Sources: Field Survey, 2007

Table 3: System of farm management

System of management	Frequency	Percentage (%)
Intensive System	111	92.5
Semi-intensive System	9	7.5
Extensive System	0	0.0
Total	120	100.0

Sources: Field Survey, 2007

Table 4: Mortality rate of birds on farm

Mortality rate	Frequency	Percentage (%)
High	100	83.3
Low	20	16.7
Total	120	100.0

source: Field Survey, 2007

Table 5: Common breeds of broiler reared by farmers

Breeds of broiler	Frequency	Percentage (%)
Anak	30	25.0
Plymouth rock	28	23.3
Arbour acre	23	19.2
Rhode Island Red	20	16.7
Ross	19	15.8
Total	120	100.0

Source: Field Survey, 2007

It can be observed in the Table 5 that 15.8% of the farmers reared Ross breeds of broilers, 16.7% reared Rhode Island Red breeds, 19.2% reared Arbour acre breeds, Plymouth Rock are reared by 23.3% of the farmers while 25% of the farmers reared Anak breed. This indicates that Anak broiler are the most common breeds reared in the area of study. According to Falaye (2000) broilers are important in providing a valuable source of protein in form of meat. Also, Iwena (2002) said that broilers are to produce poultry products richer in protein.

In the Table 6, 53.3% of farmers reared only one breed of broiler, 43.3% reared two breeds of broiler while 3.3% of farmers reared more than two breeds of broilers. This indicates that majority of the farmer's preferred to rear only one breed of broiler because of easy management.

The Table 7 presents the types of problems that are experienced by farmers on farm. 8.3% of the farmers

Table 6: Numbers of breeds reared by farmers

No. of breeds	Frequency	Percentage (%)
One breed	64	53.3
Two breeds	52	43.3
More than two breeds	4	3.3
Total	120	100.0

Source: Field Survey, 2007

Table 7: Types of problem on farm

Types of problem	Frequency	Percentage (%)
Diseases pest	51	42.5
Diseases/natural disasters	35	29.2
Natural disasters	24	20.0
None	10	8.3
Total	120	100.0

Source: Field Survey, 2007

Table 8: Major causes of farm problem

Causes	Frequency	Percentage (%)
Poor management/ low capital	42	35.0
Poor management/ low capital/diseases	31	25.8
Lack of experience	17	14.2
Diseases/pest	14	11.7
Poor management/ lack of experience	14	11.7
None	2	1.7
Total	120	100.0

Source: Field Survey, 2007

had experience no problem on their farm, 20% of the farmers had experienced natural disasters such as high temperature etc. as a problem, 29.2% experienced diseases and natural disasters and pest problems on their farm. This indicates that majority of the broiler producer had experienced the problem of diseases and pest on their farm that leads to high mortality rate of birds. According to Oluyemi and Robert (2000) poultry diseases are major causes of financial losses in the poultry. He also said that loss may occur due to the poor level of performances.

The Table 8 presented the major causes of problem 11.7% of farmer had poor management and lack of experience as the major causes of their farm problem, 11.7% of the farmer had diseases and pest as the major causes of the farm problem, 14.2% of farmers recorded lack of experience, 25.8% of the broiler producing farmers also recorded poor management, low capital and diseases as the major causes of the farm problem, 35% of the farmers had poor management and low capital as the major causes of their farm problem. This indicates that high mortality on the farm is mostly caused by poor management of farm and low capital. According to Oluyemi and Robert (2000) in broiler production, poor management leads to poor production of broiler birds. Also, Ogunsina (1982) opined that environment is one of the most important factors that determine the production of broiler.

Table 9: Common diseases on the farm

Types of diseases	Frequency	Percentage (%)
Coccidiosis	61	50.8
New castle	30	25.0
Gumboro	19	15.8
Fowl cholera	5	4.2
Chronical respiratory diseases	4	3.3
Aspergilosis	1	0.8
Total	120	100.0

source: Field Survey, 2007

Table 10: The following result were obtained from the mortality rate of various broilers breeds

	Breeds of broilers				
Mortality	Anak	White specie	Arbour acre	Rhode Island Red	Ross
High	25	24	19	18	14
Low	5	4	4	2	5
Total	30	28	23	20	19

Table 11: Using reliability analysis of variance with spss (computerized statistical package)

Sources of variation	Sum of square	Degree of freedom	Mean square	Frequency
Between groups	672.400	1	672.400	73.087
Within groups	73.600	8	9.200	
Total	746.000	9		

Degree of freedom: Numerator = 1, Denominator = 8

If F Cal > F Tab – Reject Null Hypothesis (H0) and Accept (H1) Hypothesis

0.8% of the farmers had experienced Aspergilosis diseases on the farm, chronical respiratory diseases affected 3.3% of the farms, fowl cholera affected 4.2% of farms, 15.8% farmers recorded Gumboro diseases infection on their farm, Newcastle diseases affected 25% farms while 50.8% farms had experienced the infection of coccidiosis. This indicates that coccidiosis is highly rampant in most farms because it is caused as a result of wet litter and most farms used deep litter system for their management system of rearing. This is a sign of poor management which was also reported by Martland (1984), He opined that wet litters and caked litters are litters that are conducive to the outbreak of coccidiosis. Litter has to be well managed in order to prevent chicks from getting contact with any disease condition; Iwena (2002).

The stated hypothesis was tested:

H0: There is no significant difference in the mortality rate of various broiler breeds during brooding stage.

H1: There is significant difference in the mortality rate of various broiler breeds during brooding stage.

The calculated value of F is 73.087. The table value of F at degree of freedom of 1 and 8, at 95% level of significant = 0.0042, while it is 0.00017 at 99% level of significant and 0.0000017 at 99.99% level of significant. F cal > F tab, this means that mortality rate is statistically

significant i.e. there is significant difference ($p<0.001$) in the mortality rate of various broiler breeds during brooding stage.

Recommendations: High mortality rate is one of the problems that affect poultry bird's production and performances; it also affects the income of the farmers. Based on the findings above, it has shown that farmers are to put some things into consideration, so as to reduce high mortality of birds and to boost income. The following are recommended.

Broiler farmers should ensure proper hygienic environment of the farm in order to avoid death of the birds.

Broiler farmers should ensure proper management and good health care of birds so as to reduce mortality rate and better production.

Adequate nutritious feed should be given to birds in order to increase their productivity; reduction in the feed in take of broiler affects their production. Feeding is essential in poultry because it determines the growth and performance of broiler increase in feed of broiler increase their growth.

Government should organize seminars, workshops etc. so as to increase farmer's awareness on broiler health needs.

Wet litters should be avoided. Good quality litter, fresh and dry litter should be used in order to avoid the risk of introducing various vectors of diseases and germs such as coccidiosis to the farm.

Farmers should be enlightened by the government on how to improve their broiler production; loans should be given to farmers in order to boost their broiler production so that enough poultry birds richer in protein such as broiler would be produced for consumption.

Breeds of broilers that are resistance to diseases should be used in order to improve their production. Breeds that are resistance to disease mature early and minimize loss on the farm, thereby increasing income of the farmer e.g Ross breed as revealed in this study.

Disinfected food bath at the base of the poultry house can also be used to prevent high mortality rate of birds whereby both attendants and visitors will deep their feet in before entering the poultry house.

Adequate ventilation and appropriate temperature must be provided to birds by farmers. Adequate ventilation prevents high humidity that can lead to wet litter; it prevents and removes ammonia from the poultry house. It also removes stale air and provides fresh air richer in oxygen.

Therefore, all the above management practices should be taken into consideration by farmers in order to reduce mortality rate of birds on farm and to maximize their profit.

Conclusion: The study shows that among many problems that affect the performances and production of broiler breeds in Ogun State, Major problems include high mortality rate which could be as a result of poor management of the farm due to the feeding rate of broilers, litter management etc. Wet litter exposed broiler breeds to various vector of germs and diseases such as coccidiosis. Although, intensive system is the type of management used during brooding stage of broiler production in the study area which are mainly deep litter. The supply of adequate ventilation removes the effect of high temperature and high water vapour in the poultry house.

In conclusion, adequate management of the farm, nutritious feed, proper hygienic environment etc. can reduce the mortality rate of various broiler breeds thereby contributing to the development of broiler production for table meat like Ross breed and Rhode Island Red that are resistance to diseases and that mature early should be used for production so as to increase protein requirement of man and reduce protein deficiency. Feeding is highly essential in the broiler production; birds should be well fed with nutritious feed so as to maintain good health care of broilers and to increase their productivity. The result of the findings has shown that Anak breeds is the most common breed used for production by most farmers in Ogun State because it is easily available to farmers, though it has high rate of mortality while Ross breeds is not commonly used because farmer find it difficult in getting the breed since it is not available in the area of study though is having low mortality rate and is resistance to diseases, it mature early and easily convert its feed intake to meat production. Therefore, in conclusion, Ross breed is the best breed of broiler and it is hereby recommended to be used in order to reduce the mortality rate of broilers on farm.

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