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**A RETROSPECTIVE STUDY ON THE OCCURRENCE OF NEWCASTLE DISEASE IN ORLU ZONE IMO STATE, NIGERIA**

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**ABSTRACT**

*Newcastle Disease is endemic in Nigeria. It is characterized by high morbidity, high mortality, high cost of treatment and losses in the genetic and reproductive potentials of affected flocks. This study examined factors that influenced the incidences of Newcastle Disease in Orlu Senatorial Zone, Imo State over a one year period (September 2011 to August 2012). A total of 38 cases were identified from farm records and questionnaires. The disease showed seasonal variations with highest incidences reported during the rainy season - particularly during the early rainy season, than in the dry periods of the year. Management practices also affected the rate of occurrence of the disease with the highest occurrence seen in farms where deep litter system was practiced. Additionally, the educational background of farmers was also a factor that affected the incidence of the disease with farmers whose highest qualification was First School Leaving Certificate recording the lowest cases of the disease. Results also revealed that farmers generally showed preference for veterinary intervention than for self medication and other forms of interventions including consulting friends and other farmers. Again, First School Leaving Certificate holders were the ones that most frequently consulted Veterinarians. The incidence of Newcastle disease outbreaks vary according to seasons and management practices as well as educational background of farmers. Therefore, for any control and monitoring measures for the outbreak of Newcastle disease to be very effective, these factors will have to be strongly considered.*

**Keywords:** Newcastle Disease, Retrospective study, Occurrence, Orlu zone, Imo State, Nigeria.

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**INTRODUCTION**

Newcastle Disease (ND) is one of the commonest and most dreaded avian diseases of poultry in Nigeria and indeed all over the world [1,2]. It affects most species of domestic birds of all ages and sexes [3] including chicken, turkey, ducks and pigeons [4]. However, chicken remain the

most susceptible [5]. Newcastle disease (ND) is a fatal disease that causes respiratory, gastrointestinal, nervous and reproductive problems in affected flocks [6]. Morbidity and mortality rates for ND may be up to 90 – 100 %, especially in unvaccinated flocks [7]. Thus, losses due to ND can be enormous with far reaching consequences to the farmer's investments [8,9]. Routine vaccination programmes remain one of the strongest control measures against the disease [10] with many inactivated and live ND vaccines available all over the world [11].

However, even with these instituted vaccination programmes, outbreaks continue to occur [12]. Occurrence and outcome of control measures against ND vary and sometimes unpredictable especially without good quarantine and proper biosecurity [10]. This study seeks to investigate factors that influence the occurrences of ND in poultry farms in Orlu zone of Imo State, Nigeria.

## **MATERIALS AND METHODS**

### **Study Area**

This study was carried out in the 12 Local Government Areas that make up Orlu Zone of Imo State in Southeast Nigeria. Orlu has latitude and longitude coordinates of 05°47'47"N and 07°02'20"E. Imo State itself lies within latitudes 4°45'N and 7°15'N, and longitude 6°50'E and 7°25'E. Precipitation in Orlu Zone averages 869 mm.

### **Study Period**

The study was retrospective and covered the period from September 2011 to August 2012.

### **Data collection**

A total of 60 commercial poultry farms in Orlu Zone were sampled. Five farms were randomly sampled in each of the 12 Local Government Areas. To ascertain occurrences of Newcastle Disease, farm record books were reviewed, questionnaires and oral interviews conducted with veterinarians, farm managers and/or other staff in each farm were also used for data collection.

### **Data analysis**

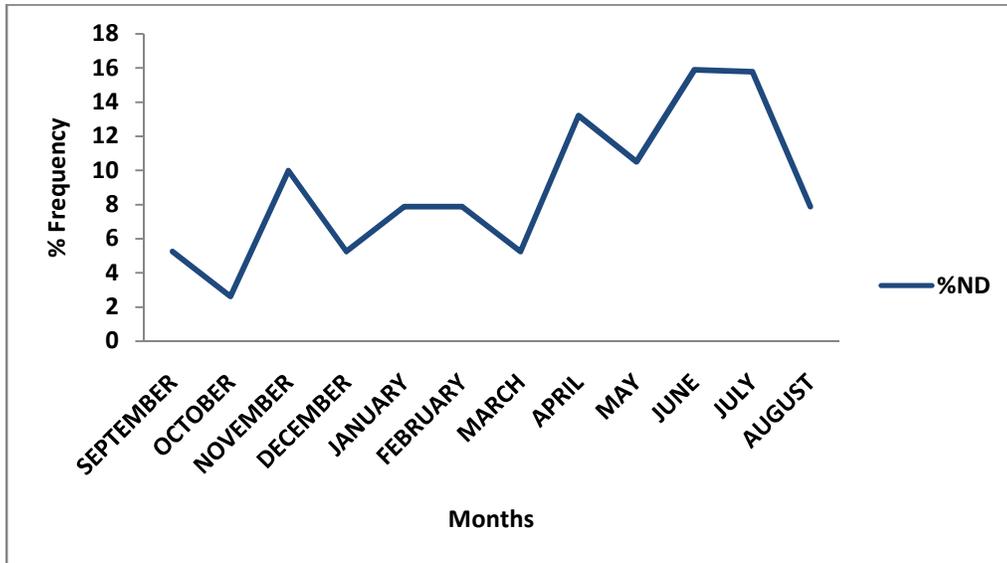
The data obtained were analyzed using descriptive statistics (frequency and percentages) and the results presented as graphs and charts.

## **RESULTS**

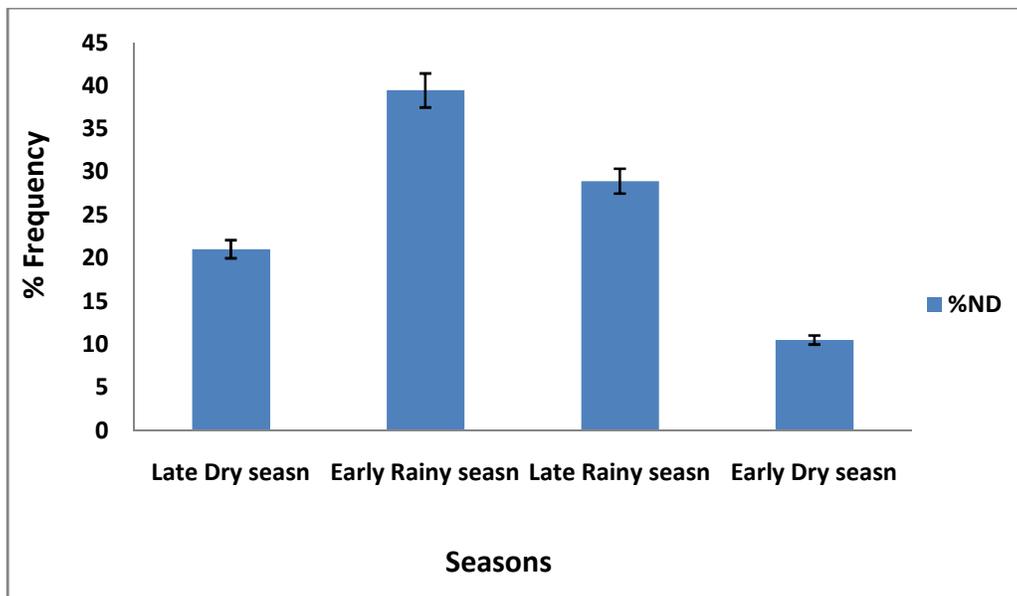
A total of 38 reported cases were recorded from the retrospective analyses of farm records. The study showed variations in the occurrence of ND in Orlu zone of Imo State over the 12 month study period (Fig 1). The highest occurrences of the disease were during the rainy periods of the year, particularly in the early rainy season (Fig 2).

In terms of the management practices used by farmers (Fig 3), it was observed that farms using the deep litter housing system recorded the highest cases of ND (63.12 %) followed by battery cage systems (26.3%). It was also observed that farms managed by First School Leaving Certificate (FSLC) holders recorded the lowest occurrence of ND (10.5%), while tertiary institution graduates recorded the highest cases (34.2 %) followed by Senior Secondary Certificate (SSC) holders (29 %) and those with technical training (26.3 %) in that order.

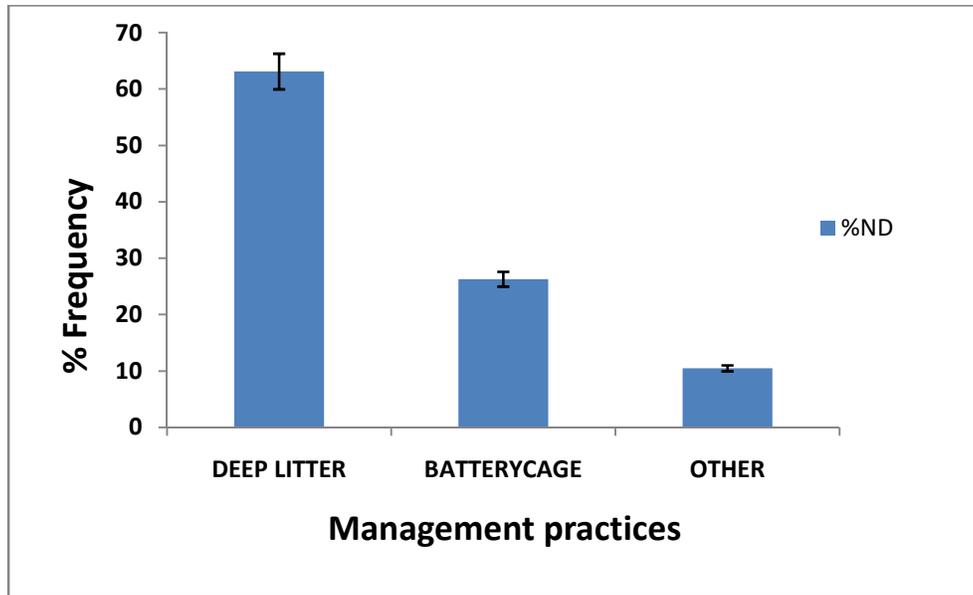
Farm sizes of more than 1,000 birds fared better with an occurrence of 10.5 %, followed by medium-sized farms (500-1,000 birds) with 26.3 % and small scale farms of less than 500 birds recording the highest occurrence of 63.2 %.



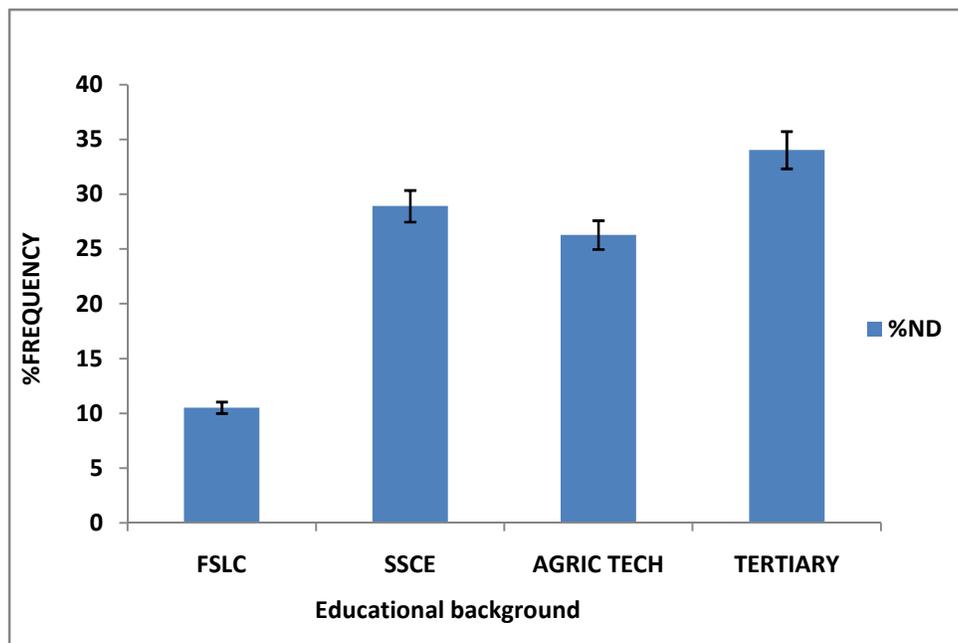
**Fig 1. monthly variations of ND incidence in Orlu Zone of Imo State over a 12-month period.**



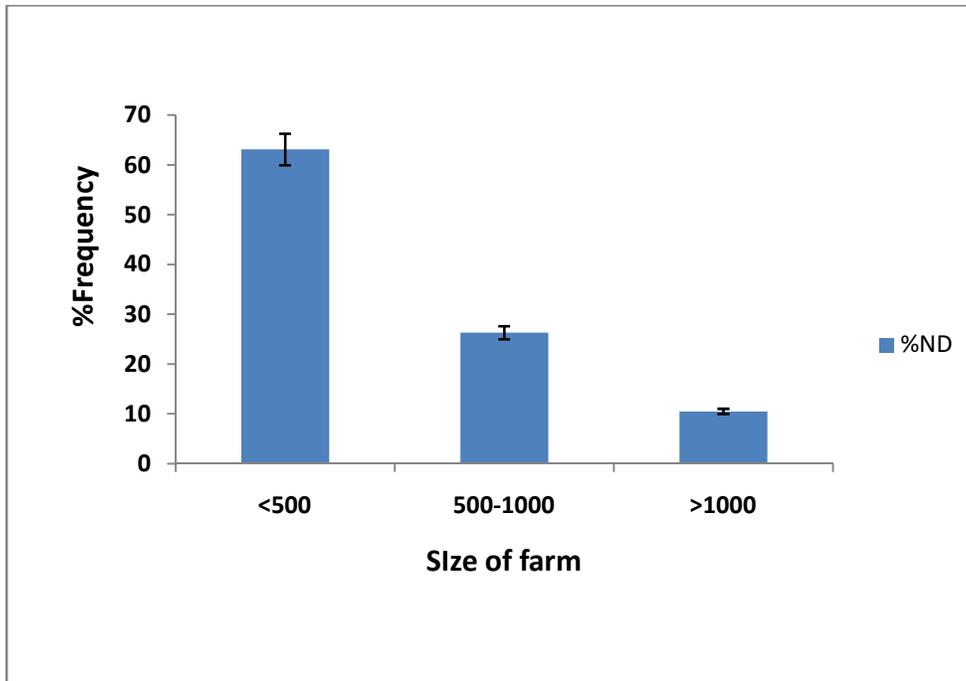
**Fig 2. Seasonal variations of ND in Orlu Zone of Imo State.**



**Fig 3.** incidence of ND in birds raised under different management systems in Orlu Zone of Imo State. (NB: Other include semi-intensive, free range, etc.).



**Fig 4.** Relationship between educational background of farmers and incidence of ND in Orlu Zone of Imo State.



**Fig 5. Incidence of ND according to Farm sizes in Orlu Zone of Imo State.**

## DISCUSSION

The variations in monthly occurrence observed for Newcastle disease (Fig.1) over the study period is perhaps to be expected considering the ambient changes in weather that takes place over 12 months. Changes in weather affect the overall microbial environment and also put a strain on the management system of the farms as they try to adapt. This is particularly so as the housing system used in all the farms is the open house type that expose birds to the vicissitudes of the weather. The peak occurrence for the disease over the 12-month study period was in the rainy season (Fig. 2). The wetness and high humidity of the environment that goes with the rainy periods of the year supports the burden of microbes and other parasites, and this would have increased the challenge on the immunologic system of the birds. This is similar to the previous observation of peak prevalence in indigenous chicken during early rainy season [13]. However, Nwanta *et al.* [14] reported highest prevalence during the dry season in village poultry, attributing it to peak movement of birds for sale during festivities, which apart from exposing the birds to infection is, in itself, a stress factor.

The high incidence recorded for deep litter management system (Fig. 3) over Battery cage and other management systems could also be due to exposure of birds to increased viral load in the litter. Poor litter management creates favourable environment for active proliferation of ND [15]. Elevated ammonia levels, accumulated litter materials and high relative humidity were observed in some flock houses with deep litter management system during farm inspection.

It is interesting to note that the study revealed lowest frequency of occurrence for ND among first school leaving certificate (FSLC) holders and highest with graduates (Fig. 4). This could be because unlike their counterparts with higher educational exposure, FSLC holders are less likely to differentiate diseases in birds. It could also be that they are less likely to rely on self

medication and more inclined towards professional (veterinarians) advice in the prevention and control of diseases. Nwanta *et al.* [14] reported that manifestations of ND are affected by the socio-economic status of owners.

The fact that farms with flock sizes above 1000 birds had significantly less incidences of disease occurrence than those with flock sizes less than 500 (Fig. 5) is perhaps to be expected. Farm sizes of over 1000 birds represent significantly higher investments than smaller farms of less than 500 birds and are thus more likely to afford and adopt stricter preventive measures such as strict vaccination programmes and tougher bio-security protocols.

### **Conclusion and Recommendations**

The study showed that outbreaks of Newcastle Disease is affected by other factors such as time and season of the year, management system in use as well as educational level of farm owners. Therefore, for any control and surveillance measures aimed at combating Newcastle disease to be very effective, these factors must be taken into consideration.

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