

## Seroprevalence of Egg Drop Syndrome '76 Virus as Cause of Low Egg Productivity of Poultry in Anyigba, Middle Belt Region of Nigeria

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**Abstract:** To determine the possibility of Egg Drop syndrome '76 virus infection as one of the causes of low egg production in commercial poultry farms in the middle belt of Nigeria and to know the prevalence of the infection. Five farms with the history of low eggs production in Anyigba, Kogi State were randomly selected and sera from ten hens in each of the farms were screened for antibodies against EDS '76 virus by Haemagglutination Inhibition (HI) test. The mean HI titer of the ten hens in each farm was recorded as EDS '76 antibody titer for the farm. The 5 farms tested were positive for EDS '76 antibodies with HI titer ranging between 16 and 128.

**Key words:** EDS '76, HI test, antibodies EDS '76, Nigeria

### INTRODUCTION

Egg Drop Syndrome '76 (EDS '76) is a viral disease that brings about low egg production in chickens without any other clinical manifestations. The disease was first reported in The Netherlands by Van Eck *et al.* (1976). The disease is characterized by sudden drop in egg production, failure of hens to achieved peak production and by the laying of eggs with shell defects such as thin shelled, soft shelled and shell-less eggs by apparently healthy flock (McFerran *et al.*, 1978). The disease has been recognized as a potential threat to the poultry industry especially in the layer and breeder flocks (Nawathe and Abegunde, 1980).

Nawathe and Abegunde (1980) also reported high incidence of antibodies to Egg Drop Syndrome '76 virus among commercial layers in Northern Nigeria. Durojaiye *et al.* (1991) reported the disease in poultry in the Western part of Nigeria. Also, Ezeibe *et al.* (2008) have reported this problem in the Eastern part of Nigeria. So far, no documented report of EDS '76 in the middle belt region of Nigeria has been made.

Farmers in Anyigba, Kogi State a central state situated in the middle belt of Nigeria have serious complains about low egg production and small size eggs and extremely small size with rough polar ends and sometimes normal size with thin shells. However, most farmers in the area are ignorant of the existence of the EDS

'76 and as such have never vaccinated their hens against the disease. The study was therefore designed to determine if EDS '76 is among the causes of low egg production in the middle belt of Nigeria and the prevalence the infection among poultry farms with history of low egg production.

### MATERIALS AND METHODS

Five commercial layer farms in Anyigba, Kogi State, middle belt of Nigeria with complaints of low egg production were visited. Ten hens in each farm were randomly selected and breed for sera. The sera were stored at -20°C until used for Haemagglutination Inhibition (HI) test to detect antibodies against Egg Drop Syndrome '76 virus. The EDS '76 antigen from local ducks in Nigeria and EDS '76 positive and negative sera were obtained from National Veterinary Research Institute (NVRI), Vom, Jos, Nigeria. The HI test was done as described by Villegas *et al.* (1979). The red blood cells used was 0.6% chicken red blood cell prepared according to the method described by Wosu (1984).

Sera double dilution of each serum from the five farms was made in U bottomed micro titer plates. Equal volume (0.03 mL) of 4 Haemagglutinating Units (4HAU) of a standard egg drop syndrome '76 virus antigen was then added to each well. This was then incubated at room temperature for 45 min before same volume (0.03 mL) of

the 0.6% chicken red blood cell was added to each well. For virus control, serial doubling dilutions of 0.03 mL of the 4HAU of the EDS '76 virus was made in separate wells. And 0.03 mL of the 0.6% chicken red blood cell was added to each well.

Red blood cell (RBC) control was also included in the protocol by adding 0.03 mL of the 0.6% chicken RBC to wells containing only 0.03 mL of Phosphate Buffered Saline (PBS) with pH of 7.2.

The whole set up was incubated at room temperature until the RBC in RBC control wells settled. The HI titers were read as the reciprocal of the highest dilution of the sera which inhibited haemagglutination (HA) of chicken RBC by the EDS '76 virus when the RBC control was HA negative and the virus control was HA positive. Titers of 16 and above were regarded as positive for EDS '76 virus antibodies as suggested by Bishop and Cardozo (1998). Mean HI titers of the 10 hens in each flock was calculated and recorded as HI titers of the flock with standard deviation as described by Steel and Torrie (1980). Also, history of each flock and their pattern of lay were studied.

## RESULTS AND DISCUSSION

The 5 farms in Anyigba, Kogi State in the middle belt region of Nigeria screened were EDS '76 antibody positive with HI titers of between 16 and 128 (Table 1).

Egg Drop Syndrome '76 virus infection is characterized by sudden drop in egg production, failure of hens to achieve peak production and by the laying of eggs with shell defects such as thin shelled, soft shelled and shell-less eggs by apparently healthy flock (McFerran *et al.*, 1978). Nawathe and Abegunde (1980) reported a relatively high incidence of antibodies of EDS '76 virus in commercial farms in Northern States of Nigeria.

Durojaiye *et al.* (1991) and Ezeibe *et al.* (2008) also reported antibodies of EDS '76 virus in poultry in western and eastern states of Nigeria respectively. Ezeibe *et al.* (2008) recorded HI titers of 16-256 in 90% of farms with lower egg production in Nsukka, Enugu State, South Eastern part of Nigeria.

In this study, HI titers of 16-128 in 100% of farms with low egg production in Anyigba, Kogi State were recorded suggesting serological evidence of EDS '76 virus infection in the Middle Belt region of Nigeria. The high seroprevalence (100%) got among farms screened suggests that EDS '76 virus infection is a major cause of most cases of low egg production in the middle belt region of Nigeria.

Table 1: EDS '76 antibody titer prevalence in farms A to E

Farm	Egg production	Length of lay (months)	EDS '76 virus antibody titer (HI)
A	10	1	128±35.05
B	50	7	64±28.49
C	60	5	128±0.00
D	50	4	64±45.20
E	5	1	32±21.69

The fact that birds in farms A and E which just started laying for barely 1 month are also sero positive with high titers of 128 and 32, respectively suggests the vertical transmission of the EDS '76 virus. McFerran *et al.* (1978) had reported that if EDS '76 virus is introduced into a site, the effects on egg production can be seen in all ages of laying hen.

History and observations revealed that some of the eggs laid in Farm E are thin shelled and small sized. Eggs laid by hen infected with EDS '76 are small in size. However, in Farm C about two hens laid extremely small sized eggs with rough or granular polar ends.

## CONCLUSION

EDS '76 virus infection could be a threat to Nigerian Poultry industry because there is, at present, no government policy to protect poultry farms against the disease. Farmers in the middle belt of Nigeria should be encouraged to vaccinate their layers with oil adjuvant EDS '76 vaccine between 14 and 16 weeks of age as recommended by McFerran *et al.* (1978).

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